



Assemblea degli Azionisti Shareholders' Meeting

Report on the item of the Agenda

Trieste 14 October 2014

Ordinary Shareholders' Meeting



Corporate Bodies as of 30 July 2014

CHAIRMAN

Gabriele Galateri di Genola

VICE-CHAIRMAN

Francesco Gaetano Caltagirone

Clemente Rebecchini

GROUP CEO

Managing Director and General Manager

Mario Greco

DIRECTORS

Ornella Barra Alberta Figari Jean-René-Fourtou Lorenzo Pellicioli Sabrina Pucci Paola Sapienza Paolo Scaroni

STATUTORY AUDITORS Carolyn Dittmeier, President

Lorenzo Pozza Antonia Di Bella

Francesco Di Carlo (substitute) Silvia Olivotto (substitute)

SECRETARY OF THE BOARD OF DIRECTOR

Antonio Cangeri



ASSICURAZIONI GENERALI S.P.A.

Registered office: Trieste, piazza Duca degli Abruzzi 2 Share capital: Euro 1.556.873.283,00, fully paid up Taxpayer number and Trieste Company Register no.: 00079760328

Insurance and Reinsurance Register no.: 1.00003

Parent Company of Generali Group, Insurance Group Register no. 026

Notice of call of the Shareholders' Meeting

Shareholders are invited to attend the Shareholder's Meeting at the corporate registered office in Trieste, Piazza Duca degli Abruzzi 2, on

— 14 October 2014, at 3.00 p.m. in ordinary session, in a single call,

to pass resolutions on the following

AGENDA

Resolutions pursuant to article 7, paragraph 4, of the Decree no. 220, dated 11.11.2011, of the Ministry for Economic Development.

ADDITION OF NEW ITEMS TO THE AGENDA AND NEW DRAFT RESOLUTIONS

Shareholders who, either individually or jointly, account for at least one-fortieth of the share capital may request additions to the agenda within ten days from the publication of this notice of call, i.e. by 12 September 2014. Shareholders may either add new items to the agenda or new draft resolutions on items that are already on the agenda. Any such request must be submitted together with the certification on the ownership and required number of shares held by the Shareholders submitting the request on additions to the agenda, duly issued by the intermediary depositary. The request must be filed, in writing, at the Company registered office, to the attention of the Head of the Group Corporate Affairs, or by mail or to the certified e-mail address azioni@pec.generali.com. Any addition of new items to the agenda or

any new draft resolution on items that are already on the agenda will be notified in line with the requirements on the notice of call by the deadlines specified in the applicable regulations. Shareholders requesting additions of new items to the agenda or new draft resolutions on items that are already on the agenda must draft a report stating the reasons for the draft resolutions regarding the new items they suggest or the reason for the additional draft resolutions on items already on the agenda. Such report must be submitted to the Board of Directors within the deadline for the request of additions of new items or additional draft resolutions, i.e. 12 September 2014. The report must be delivered at the Company registered office to the attention of the Head of the Group Corporate Affairs, also by mail or to the certified e-mail address azioni@pec.generali.com. The report will be made available to the public, together with any remarks of the Board of Directors, when the notice of additional items is published.



DOCUMENTATION

The report by the Board of Directors on the item of the agenda will be filed, within the deadline specified in the applicable regulations, at the Company registered office. This document will be available to the public and copies may be obtained upon request. This documents will also be published on the corporate Web site, www.generali.com, in the Investor Relations 2014/10 Shareholders' Meeting section, together with forms that Shareholders may use to appoint proxies, as indicated below and at Computershare S.p.A., which is authorised, pursuant to article 113-ter, paragraph 4, point b), of the Legislative Decree no. 58/1998, on the central filing of regulated information, "1Info". The corporate Web site also contains information about the amount of the share capital, with details on the relevant number and categories of shares.

RIGHTS TO SUBMIT QUESTIONS

Shareholders with voting rights may ask questions about the items on the agenda also before the Shareholders' Meeting, up to the end of the third day before the date of the Meeting, i.e. by 11 October 2014. Shareholders are required to deliver their questions to the Company registered office, to the attention of the Head of the Group Corporate Affairs, or e-mail them to azionisti@generali.com, or to the certified email address azioni@pec.generali.com in line with the procedures published in the Company Web site. Questions received before the Shareholders' Meeting will be answered at the latest during the Meeting. Questions on the same topic may be answered jointly.

ATTENDANCE

Entitlement to attend the Shareholders' Meeting and exercise voting rights is proved by a certificate issued to the Company by an authorised intermediary in accordance with its books of account, in favour of the party holding voting rights. The certificate is issued by the

intermediary on the basis of the evidence on the record date (<u>3 October 2014</u>), namely the seventh market trading day before the date of the Shareholders' Meeting.

Debit and credit entries made after that date will not be taken into account for the purpose of establishing entitlement to vote at the Shareholders' Meeting: any owners of shares after that date will not be entitled to attend to or vote at the Shareholders' Meeting. The owners of shares which have not yet been dematerialised may only attend the Shareholders' Meeting if their share certificates have been filed with a party authorised to input them into the dematerialisation system, and to issue the subsequent notice by the authorised intermediary.

Shareholders Attendance of at the Shareholders' Meeting is governed by the applicable legislation and regulations and by the provisions of the Articles of Association and the Shareholders' Meeting Regulation, which are available at the registered office and on the Company's website. Shareholders with voting rights may appoint a proxy to represent them at the Shareholders' Meeting as specified in the applicable regulations. Shareholders may appoint the Company's designated representative, "Computershare S.p.A.," as proxy with voting instructions, free of charge, pursuant to s. 135-undecies of the CFBA. The proxy must be made by signing the proxy form which is available on the Company's Web site, in the Investor Relations - 2014/10 Shareholders' Meeting section, from 13 September 2014. This proxy form must be delivered by 10 October 2014 to Computershare S.p.A., according to the procedure specified in paragraph 1 of the "Instructions on how to fill in and file the form" as reported in the form.

The proxy is not valid on items for which voting instructions have not been provided. The proxy and voting instructions may be cancelled within the specified deadline and in line with the applicable procedure.

The certificate issued to the Company by the intermediary, proving that the Shareholder is entitled to attend the Shareholders' Meeting and exercise their voting rights, is also required if the designated representative is



appointed as proxy: if the certificate is not delivered, the proxy is deemed to be null and void. Shareholders may also appoint a proxy by filling in the proxy form available in the Company's Web site. The representative by proxy may deliver or send a copy of the proxy form instead of the original copy by sending it to the certified e-mail address azioni@pec.generali.com, certifying on his/ her own responsibility that the copy is a true copy of the original proxy and certifying the identity of the Shareholder. Pursuant to the applicable regulations, the representative is required to keep the original proxy form, and keep details of any voting instructions received, for 1 year since the end of the Shareholders' Meeting.

The proxy may be also granted by electronic document underwritten in electronic form pursuant to article 21, paragraph 2, of Legislative Decree no. 82, dated 7 March 2005, and sent to the certified e-mail address azioni@pec.generali.com.

PRACTICAL INFORMATION

A simultaneous interpreting service is available from Italian into a number of foreign languages (English, French, German and Spanish) during the proceedings of the Shareholders' Meeting. Headphones will be provided at the desk at the entrance. Further information or explanations about Shareholders' attendance to the Shareholders' Meeting can be obtained by e-mail azionisti@generali.com or on the phone +39040671621, +39040671352 and telefax +39040671300, +39040671660; others wishing to attend the Shareholders' Meeting may contact the following numbers: for experts and financial analysts: phone +39040671402 and telefax +39040671338; for the press: phone +39040671102 and telefax +39040671127.

For the Board of Directors The Chairman (Gabriele Galateri di Genola)



Report of the Board of Directors to the Shareholders' Meeting

RESOLUTIONS PURSUANT TO ARTICLE 7, PARAGRAPH 4, OF THE DECREE NO. 220, DATED 11.11.2011, OF THE MINISTRY FOR ECONOMIC DEVELOPMENT

Shareholders,

The ordinary Shareholders' Meeting has been called to pass a resolution on the potential revocation of Mr Paolo Scaroni from his office as Director of the Company, pursuant to article 7, paragraph 4, of Decree of the Ministry for Economic Development no. 220, dated 11.11.2011.

Pursuant to both the provisions of article 76 of the Legislative Decree no. 209, dated 7 September 2005 (the "Italian Insurance Code") and the abovementioned article of the Ministerial Decree no. 220/2011, board of directors of Italian insurance companies are required to suspend from the office any director that has received a non-final conviction to imprisonment exceeding two years for any intentional offence. Pursuant to article 7, paragraph 4, of Ministerial Decree no. 220/2011, the board of directors is required to insert the item of the potential revocation of the director in the agenda of the first shareholders' meeting after the occurrence of the suspension.

As is well known, on 31 March 2014, the Court of Rovigo issued a first degree judgment against, among others, Mr Paolo Scaroni – in relation to his office as managing director of Enel S.p.A. from May 2002 until May 2005 - imposing a term of imprisonment of three years and the prohibition to perform any public office (*interdizione dai pubblici uffici*) for five years, for the offence set forth in article 434, paragraph 1, of the Italian Penal Code, in relation to infringements concerning environmental matters at the Enel plant in Porto Tolle.

The abovementioned judgment does not concern, in any way, the office of Mr Paolo

Scaroni as member of the Board of Directors of the Company nor the performance of any activity in the insurance and/or financial business.

Further to this judgment, Mr Paolo Scaroni, by means of a letter dated 12 May 2014, after having explained the reasons why he believes himself not responsible for the abovementioned charges, notified his decision to suspend himself from the office as member of the Board of Directors of Assicurazioni Generali S.p.A., thus supporting the correct execution of the activities of the Board of Directors pending the call of the Shareholders' Meeting. The Board of Directors, in the meeting held on 14 May 2014, acknowledged the abovementioned communication of Mr Scaroni, declaring that, pursuant to article 76, paragraph 2, of the Italian Insurance Code and article 7 of Ministerial Decree no. 220/2011, the suspension from the office of director will continue until the Shareholders' Meeting will resolve on the above matter.

Therefore, in this meeting of 30 July 2014, the Board of Directors has called the Shareholders' Meeting, pursuant to article 7, paragraph 4, of Ministerial Decree no. 220/2011, to pass a resolution on the potential revocation of Mr Scaroni from his office as member of the Board of Directors of Assicurazioni Generali S.p.A.. In this respect, it must be pointed out that:

— the assessment of the Shareholders' Meeting is aimed at ascertaining whether the situation resulting from the first degree judgment of the Court of Rovigo may adversely affect the relationship of trust between the Company and Mr Scaroni in his capacity as member of the Board of Directors;



the under above assessment is the exclusive competence of Shareholders' Meeting and the Board of Directors cannot provide any indication in this respect, since it may only insert the item on the potential revocation of the office of member of the Board of Directors in the agenda of the Shareholders' Meeting pursuant to article 7, paragraph 4, of Ministerial Decree no. 220/2011.

In relation to the foregoing, the Shareholders may access the following documents from the legal proceedings which have been provided by the defence lawyers of Mr Paolo Scaroni which, as far as within their competence, have authorized the provision of same documents to the Board of Directors and the Shareholders' Meeting:

- copy of the indictment of Mr Scaroni, dated 28 June 2011;
- copy of the defence report by Lawyers Alberto Moro Visconti and Enrico De Castiglione, dated 17 February 2014 (criminal proceeding no. 3946/08 R.G.N.R.; criminal proceeding no. 20/13 R.G.Trib.);
- copy of the survey by Prof. Michele Giugliano (criminal proceeding no. 3946/08 R.G.N.R.; criminal proceeding no. 20/13 R.G.Trib.), dated 6 December 2013;

- copy of part of the judgment (dispositivo della sentenza) published by the Court of Rovigo on 31 March 2014;
- copy of the notes of Lawyer Alberto Moro Visconti, dated 4 July 2014;
- copy of the order of the President of the Court of Rovigo, dated 27 June 2014.

Please note that, should the filing of the reasons of the judgment of the Court of Rovigo (which the part of the judgment (*dispositivo della sentenza*) established in 90 days from the date of the same, subsequently extended of further 90 days; such term, however, is not peremptory) occur in time for the date on which the Shareholders' Meeting will be held, any relevant documentation will be made available to the Shareholders.

In the light of the above, you are invited to resolve, pursuant to article 7, paragraph 4, of Ministerial Decree no. 220/2011, either on the reintegration of Mr Paolo Scaroni in the office as member of the Board of Directors of the Company or on his revocation.

Milan, 30 July 2014

THE BOARD OF DIRECTORS



Annexes

In compliance with the Italian privacy provisions of law (Legislative Decree No. 196/2003), the names as well as the personal data of the other subjects - defendants and injures persons - which are involved in the criminal proceedings regarding Mr Paolo Scaroni have been omitted.

[emblem of the Republic of Italy]

THE COURT OF ROVIGO

Registry Office for the

Preliminary Investigating Judges and Preliminary Hearing Judges Section

* Tel. 0425.428159 or 428189 fax. 0425.428101 *

No. 3086/09 Rg Gip (Preliminary Investigating Judges Register) No. 3946/08 Rg Nr (General Register of Criminal Investigations)

NOTICE OF LISTING OF PRELIMINARY HEARING

(Article 419 of the Criminal Procedure Code)

In relation to criminal proceedings No. 3086/09 Rg Gip (Preliminary Investigating Judges Register) against ...omissis....... and OTHERS (whose details are set out below) in relation to the offences set out in the attached application for committal for trial, the undersigned Registrar,

HEREBY NOTIFIES

THE PUBLIC PROSECUTOR: Ms. MANUELA FASOLATO
THE DEFENDANT AND HIS LAWYER:
omissis
4. PAOLO SCARONI born on 28.11.1946 in Vicenza, resident in Rome, at Viale Majno No. 12, domiciled at the offices of his lawyer Alberto Moro Visconti of the bar of Milan, in Milan Via S. Pietro in Gessate No. 2,
represented and assisted by his trusted lawyers ALBERTO MORO VISCONTI of the bar of MILAN, whose office is located in Milan, Via S. Pietro in Gessate No. 2 and ENRICO DE CASTIGLIONE of the bar of MILAN, whose office is located in Milan, Via S. Pietro in Gessate No. 2.
omissis
THE INJURED PARTIES:
omissis

that by decree dated 15.07.2011, the Preliminary Investigating Judge, Ms. Alessandra Testoni, has listed, for <u>22 NOVEMBER 2011 at 10.00 a.m. at the Palazzo di Giustizia of Rovigo, Via Verdi No. 2, first floor, Room C</u>, the preliminary hearing in relation to the application for committal for trial lodged by the Public Prosecutor on 01.07.2011, which is served together with this notice.

- * The **Public Prosecutor** is invited to send, to this office, the documentation relating to the investigations carried out following to the application for committal for trial, the parties being advised of their right to inspect the pleadings and items sent by the Public Prosecutor and to lodge written submissions and to produce documents.
- * The defendant is invited to elect or provide his domicile for any notification where this has not already been done, and is warned that any change to the declared or chosen domicile must be notified and that where there is a failure to declare or elect a domicile, or in the event that the declaration or election is insufficient or unsuitable, any subsequent notification shall be carried out in the place where this deed has been served.
- * The **defendant** is advised that he/she/it is entitled to waive the preliminary hearing and to apply for the IMMEDIATE TRIAL, for a SIMPLIFIED AND SHORTENED PROCEEDINGS or for a SIMPLIFIED AND SHORTENED PROCEEDINGS CONDITIONAL to evidence being admitted, as well as for APPLICATION OF THE PENALTY UPON REQUEST in the form and within the terms provided by law.
- * The defendant and the injured party are advised that they may, at any time, appoint a trusted lawyer. They are advised that, pursuant to the Consolidated Law of 30 May 2002, No. 115 regarding legal aid for those on a low income, they may be entitled to legal aid in the event that they meet the necessary requirements, complying with the formalities set forth in Section 78 et seq. of the said Consolidated Law; they are also advised that if they do not meet the requirements for having access to legal aid, they will be obliged to pay the court-appointed lawyer (please refer to the abovementioned Consolidated Law).
- * The **court-appointed lawyers** are advised that this document is also effective as communication for the purposes of Section 30 of Law Decree No. 271/89.
- * In addition, the **injured party** is advised that he/she/it may appear at the preliminary hearing if they so wish, or if they intend to become a civil party to the proceedings.
- * The defendant is advised that, if he/she/it fails to appear at the aforementioned hearing without pleading a legitimate impediment, the Court will proceed in their **ABSENCE**.

Rovigo, 20 July 2011

THE REGISTRAR
Ms. Silvia Lupi
[court seal and illegible signature]

[emblem of the Republic of Italy]

THE PUBLIC PROSECUTOR'S OFFICE ORDINARY COURT OF ROVIGO

No.3946/2008 on the General Register of Criminal Investigations

APPLICATION FOR COMMITTAL FOR TRIAL
- Sections 416 and 417 of the Criminal Procedure Code,
Section 130 of Legislative Decree 271/89 -

TO THE PRELIMINARY INVESTIGATING JUDGE at the Court of ROVIGO

The Public Prosecutor, Ms Manuela FASOLATO, Deputy Prosecutor at the Court of Rovigo; Having considered the documents in relation to criminal proceedings No. 3940/2008 RGNR (General Register of Criminal Investigations) against the persons under investigation as set out in the list attached hereto as Annex A (two sheets), who are represented as set out therein,

CHARGED with the offences set out in the sheets attached hereto as Annex B (five sheets)

the injured party/parties identified as follows:

as set out in the list attached hereto as Annex C (one sheet);

Underlined the admission of the following sources of evidence:

- informative reports and attachments by the Carabinieri Police Unit for the Protection of the Environment - Environmental Operations Task Force for VENICE and attachments, as well as subsequent related documents;
- notes by ARPAV [Veneto Regional Environmental Protection Agency] of Rovigo and subsequent related documents:
- judgment No. 192/6 of the Single Judge of Adria of 31/03/07, filed on 22/09/06, and judgment of the Supreme Court, Division III, of 11/1/2011 in relation to proceedings No. 3577/01;
- documents added to the court file in relation to proceedings with Criminal Investigations No. 3577/01 and 1338/05, including the report of the court-appointed expert, Prof. Tomatis;
- experts' reports pursuant to Article 359 of the Criminal Procedure Code by Mr. Rabitti, Engineer, Mr. Pini, Engineer, Mr. Scarselli and Prof. Tositti;
- expert's report pursuant to Article 360 of the Criminal Procedure Code by Mr. Rago and Mr. Cirillo
- records of seizure operations and orders for acquisition of documents;

- documentation obtained from the Ministry of the Environment, at the Veneto Regional Authority;
- correspondence received from the Ministry of the Environment and Commissione Via [the Environment Impact Assessment Commission];
- minutes of summary witness statements taken from persons informed of the facts
- minutes of examination
- documents relating to the investigations carried out by the Public Prosecutor and the Criminal Investigation Department (*polizia giudiziaria*), Environmental Operations Task Force, of the Police (*Carabinieri*) of Venice and of the Police (*Carabinieri*) of Porto Tolle;

having considered Articles 416 and 417 of the Criminal Procedure Code;

asks

the issue of a decree ordering the trial against the defendants referred to in the list attached hereto as "Annex A" for the offences set out in the sheets attached hereto as "Annex B":

and sends the file relating to the preliminary enquiries to the secretary in order to accomplish with the relevant requirements, and in particular, so that the said file may be sent together with this request.

Rovigo, 28/6/2011

THE PUBLIC PROSECUTOR'S OFFICE Ms. MANUELA FASOLATO Deputy [illegible seal and signature]

LODGED WITH THE SECRETARY'S OFFICE ON 28/6/11 AT 9.34am

The court assistant Marilena Zangirolami

[illegible signature]

TRUE COPY OF THE ORIGINAL Rovigo, 22 July 2011 The Court Registrar Ms. Silvia Lupi [court seal and illegible signature]

Attachment A [each page bears an illegible seal, the partly illegible stamp of the Public Prosecutor's Office and an illegible signature]

No. 08/003946 on the General Register of Criminal Investigations

<u>Lis</u>	List of persons under investigation and their lawyers:				
	omissis				
4.	PAOLO SCARONI born on 28/11/1946 in Vicenza, resident in ROME, VIALE MAJNO 12 domiciled in VIA S. PIETRO IN GESSATE 2, MILAN at Alberto Moro Visconti, Lawyer assisted by his trusted lawyers Alberto MORO VISCONTI of the bar of MILAN and Enrico DE CASTIGLIONE of the bar of Milan, both with offices at Via S. Pietro in Gessate 2 Milan				
	omissis				

omissis,	Paolo Sc	aroni,	omissis

being persons under investigation

A)omissis, Paolo Scaroni,omissis
in connection with the offence pursuant to and punishable under Article 110 of the Penal Code
Article 81, first paragraph, of the Penal Code, Article 437, 1st and 2nd paragraphs, of the
Penal Code, and Article 40 of the Penal Code - facts alleged dating from '98 to 31/12/2002
omissis, Paolo Scaroni,omissis, in relation to the offence pursuant to, and
punishable under, Article 110 of the Penal Code, 81, first paragraph, of the Penal Code, Article
437, 1st paragraph, and Article 40 of the Penal Code - facts alleged dating from '98 to
31/12/2004

Paolo Scaroni,omissis....., in relation to the offence pursuant to and punishable under Article 110 of the Penal Code, Article 81, first paragraph, of the Penal Code, Article 437, 1st paragraph, of the Penal Code, Article 40 of the Penal Code - facts alleged dating from 1/1/2005 to July 2009.

on the basis that each of them, to the extent of the periods of time for which they are respectively responsible, in concert with each other, as part of the same criminal design,omissis....., Scaroni andomissis....., as chief executive officers of Enel spa, registered office Viale Regina Margherita 137, Rome,omissis....., Scaroni from 24/5/2002 to May 2005,omissis....., Scaroni also as chairman of Enel Produzione spa, Potestio as head of Enel spa's production division, as well as proxy with powers pursuant to power of attorney dated 13/1/97,omissis.....,

failed to install, or failed to have installed, systems and equipment to prevent disasters and/or accidents in the workplace consisting in the danger of the onset or worsening of respiratory diseases including those set out in the table below, as well as non-specific bronchial reactivity, asthma and rhinitis, and cardiovascular diseases, as a result of the inhalation and ingestion of pollutants, such as SO2, NOx, dust, particulates, metals, including vanadium, emitted into the atmosphere between '98 and 31/12/2004 in vast quantities by the Porto Tolle power plant, which did not comply with environmental standards and was fuelled by dense combustible oil with a sulphur content, amongst the residential population in the areas surrounding the power plant, in particular children aged between 0-14, continuing to operate, and permitting the operation of, the Porto Tolle power plant with dense combustible oil with a sulphur content (with the percentages of sulphur in the DCO used varying between 3% and 1% and in any event in excess of 0.25%) without installing systems and instruments and/or without adapting the existing systems in order to reduce the emissions to within the minimum levels of concentration of pollutants on the basis of directives issued by the European Community, Decree by the President of the Republic 203/88 and the subsequent decree by the Ministry of the Environment of 12/7/90 containing guidelines for the containment of polluting emissions, as well as using fuel with a sulphur content of in excess of 0.25%, of a worse or greater environmental impact compared to other fuels available, running the power plant, and allowing it to run, by means of the four sections with a 660 MWe capacity - the first three being fuelled by combustible oil with a high sulphur content until 31/12/2002 and, from 1/1/2003 onwards, with LSC dense combustible oil with a low sulphur content, the fourth being fuelled by combustible oil with a high sulphur content until 7/11/2000 and, from 7/11/2000 onwards, fuelled by combustible oil without any sulphur content, causing it to run, however, for a shorter time than the other three sections, as shown by the following table regarding operating hours in the period 1/1/2001 - 28/1/2003:

	Electrical	Electrical
	Capacity>100 MW	Capacity=0
Group 1	11740	6300
Group 2	12500	5500
Group 3	12880	5100
Group 4	7700	10300

with a purification system to remove the pollutants contained in the smoke produced by the combustion that eliminates only part of the dust by means of so-called electro-filter systems and without installing, in the systems, any device in order to reduce the emissions of SO₂ (sulphur oxide) produced by the combustion, running, as an annual <u>average</u> figure, for 6500 hours at an average utilization rate of approximately 75% at the following average annual quantities: 39,000 t/year of SO₂, 5,200 t/year of NO₂, 780 t/year of dust, <u>resulting in an overall average impact of the power plant of 156,000 t/year of SO₂, 20,800 t/year of NO₂, 3,120 t/year of dust;</u>

failing in addition to request, or to have a request made for, the conversion of the plant in the manner and on the timescale established by Veneto Regional Law No. 36/97, which required it to be fuelled by methane gas or other alternative non-polluting sources, and imposed a duty to submit a conversion plan for the plant to the Ente Parco Delta del Po [Delta del Po Park Public Body] within twelve months of the law coming into force, and, in addition, in the manner and within the timescale established by Veneto Regional Law No. 7/99 (Regional Authority Official Bulletin No. 18/99), which required the plant to be fuelled by methane gas or other alternative non-polluting sources of equal or lower environmental impact, and a duty to submit a conversion plan for the plant to the Park's Public Body within eighteen months of the law coming into force, failing, however, to submit the conversion plans in the manner or timescale established and in accordance with Section 30 of Regional Law No. 36/97 as subsequently amended Regional Law 7/99 and all that necessary in order for those plans to be put into operation;

the aforementioned fact giving rise to a disaster and/or accident, there having been an increase in the number of hospital admissions of children (aged 0-14) living in the municipalities of Porto Tolle, Rosolina, Taglio di Po, Porto Viro, Ariano nel Polesine, Loreo, Mesola, Corbola and Goro for the following respiratory diseases:

Table 4 - diseases considered (children aged 0-14)

GROUP	CODES ICD-9	DESCRIPTION
Respiratory	460	acute rhinopharyngitis
	461	sinusitis
	462	acute pharyngitis
	463	acute tonsillitis
	464	acute laryngitis and tracheitis
	465	acute infections of the upper respiratory tracts
	466	acute bronchitis and bronchiolitis
	472	chronic pharyngitis
	473	chronic sinusitis
	474	chronic diseases of the tonsils and adenoids
	475	peritonsillar abscess
	476	chronic laryngitis
	477	rhinitis
	478	other diseases of the upper respiratory tracts
	490-496	chronic obstructive pulmonary diseases

that increase, in particular taking the period 1998 - 2002, having been calculated at 11% of all admissions of children living in the aforementioned municipalities for the diseases having the codes set out above (analysis in relation to exposure to vanadium of 674 admissions taken into account for children in relation to the aforesaid diseases, being 76 admissions that could have been avoided out of 674 observed), with a rate of 16.34% of admissions of boys (61 admissions that could have been avoided out of 376 observed) and 9% of all admissions of children living in the aforementioned municipalities for the diseases having the codes set out above (analysis carried out using biodiversity indicators in relation to exposure to SO2 and other pollutants, in relation to which SO2 acts as a tracer, emitted by the power plant, equal to 60 admissions that could have been avoided out of 674 observed), being 15% in terms of boys admitted (57 admissions that could have been avoided out of 376 observed);

in addition,*omissis*....., **Scaroni,***omissis*....., each of them for the periods of time for which they are responsible,

continuing to fail to install systems in the power plant to prevent disasters and/or accidents as a result of the emission of pollutants giving rise to the danger of the onset or worsening of respiratory diseases and a deterioration in the surrounding environment, deciding to ask for the conversion of the ENEL power plant at Porto Tolle, which, beyond 31/12/2004, remained in operation and in working order with DCO but with limits for emissions fixed at 400 mg/Nmc for SO2, 200 mg/Nmc for NOx and 50mg/Nmc for dust, first to Orimulsion (plans and request for consideration presented on 3/8/2000) and subsequently to coal (plans and request for consideration presented on 31/5/05, amended on 29/9/06 and on 24/10/07, with a series of additions being made until 2009), organizing the presentation of, and presenting and having presentations carried out of, the various plans, requests and documentation together with research that underestimated the overall impact, on the land, of the said conversions using the said fossil fuels when compared to other conversion alternatives such as methane gas or dense combustible oil without a sulphur content (or with a sulphur content of less than 1%. with plans for the sections of the power plant to be brought fully in line with environmental standards) that would have guaranteed improved performance in terms of the overall environmental impact and, therefore, not in breach of Section 30 of Veneto Regional Law 36/97 as subsequently amended Regional Law 7/99 or of the reference documents on the best techniques available for large combustion plants, including that relating to the Bref 2006 published in July 2006 by the European Commission ('Reference Document on Best Available Techniques for Large Combustion Plants'), in that both the conversion to Orimulsion and the conversion to coal would have produced emissions causing a higher level of pollution and a greater overall impact on the land when compared to methane gas, in particular, in the case of the conversion to coal, emissions of CO2 and SO2, NOx, fine and ultrafine dust, ultrafine particles, heavy metals including As, Ni and Cd (with emissions at worsening levels as a result of the massive annual emissions of heavy metals and the maximum concentrations of inorganic micro-pollutants - heavy metals - more disadvantageous when compared to a conversion to natural gas or to DCO in line with environmental standards with equal capacity), with the danger of the onset or worsening of respiratory diseases amongst the residential population in the areas surrounding the power plant as a result of the inhalation and ingestion of the said pollutants emitted into the atmosphere by the power plant, considering in particular the short term estimates with figures that exceed the threshold of 5% as a maximum contribution as regards Air Quality limits for SO2 and NOx, as well as taking into account, in addition, the increase over the short and long term in the fine and ultrafine dust both as primary contribution and a contribution to secondary aerosol formation as well as As, Ni and

The aggravating fact referred to in the 2nd paragraph of Article 437 of the Penal Code in the periods of time referred to above and up until 31/12/2002, being the increase in the number of admissions for the period '98 to 2002, took place in Porto Tolle;

The fact referred to in the 1st paragraph of Article 437 of the Penal Code in the periods of time referred to above and until 31/12/2004 with reference to the danger of the onset or worsening of respiratory diseases including nonspecific bronchial reactivity.

asthma and rhinitis and cardiovascular diseases as a result of the emission of pollutants into the atmosphere by the DCO powered plant and from 1/1/2005 until July 2009 for the purposes of the 1st paragraph of Article 437 of the Penal Code with reference to the continued failure to install systems in the power plant - which remained in operation and in working order to a reduced extent beyond 31/12/2004 - to prevent disasters or accidents as a result of the emission of pollutants giving rise to the danger of the onset or worsening of respiratory diseases, presenting conversion plans in breach of Regional Law No. 36/99, Section 30, and Bref 2006, was carried out in Porto Tolle.

[emblem of the Republic of Italy]

THE PUBLIC PROSECUTOR'S OFFICE AT THE COURT OF ROVIGO

Proceedings No. 08/003946 R.G.N.R. (General Register of Criminal Investigations)

List of injured parties and their lawyers:

[illegible text]
[each page bears an illegible seal, the partly illegible stamp of the
Public Prosecutor's Office and an illegible signature]

[emblem of the Republic of Italy]

THE PUBLIC PROSECUTOR'S OFFICE AT THE COURT OF ROVIGO

Proceedings No. 08/003946 R.G.N.R. (General Register of Criminal Investigations)

List of injured parties and their lawyers:					
omissis					
As per the request on the court file, I the undersigned Process Server have, to the full effect o the law, served the above document on:					
1) PAOLO SCARONI at ALBERTO MORO VISCONTI, Lawyer					
P.ZA S. PIETRO IN GESSATE, 2 MILAN 20100 (MI)					
delivering the same to the person describing themselves as					



Ave. Alberta More Visioenti. Ave. Ennos de Castilytone Ave. Roberta Guarren

Avv. Alsssandra Zunutili Avv. Edile Zeenadiii

Attny. Alberto Moro Visconti

Attny. Enrico de Castiglione

THE HONOURABLE COURT OF ROVIGO

Criminal proceedings no. 3946/08 R.G.N.R. [Criminal Records Registry] Criminal proceedings no. 20/13 R.G.Trib. [General Court Registry]

The undersigned attorneys, the retained defence counsels of

Mr. Paolo Scaroni

the defendant in the criminal proceedings referred to in the heading, submit the following

Writ of Defence

Introduction.

1. The decision of the Court of Rovigo, Separate Chamber of Adria, of 31 March 2006, and its impact on the position of Mr. Scaroni in respect of the charges relating to 2002.

As part of criminal proceedings no. 3577/01 R.G.N.R., Mr. Scaroni was charged with offences under Art. 674 of Chapter ('Ch.') A of the Penal Code ('c.p.'); Art. 635 paras. 1 and 2 of Ch. B of the c.p. (Ch. B); Art. 13 para. 5 and Art. 25 para. 7 of Presidential Decree ('D.P.R.') no. 203 (Ch. C) of 24/5/1988; Art. 25 para. 3 of D.P.R. no. 203 (Ch. D) of 24/5/1988; and Art. 25 para. 2 of D.P.R. no. 203 (Ch. E) of 24/5/1988.

From the reading these charges it can be easily inferred that Mr. Scaroni was indicted for the same conducts which are the subject matter of the present criminal proceedings.

Very briefly, the same person was charged – as part of the proceedings held before the Court in Adria – with having operated Enel's power plant at Porto Tolle "with an average of 6,500 operating hours per annum, equivalent to an output rate of around 75% of the following annual quantities:39,000 t/year of

 SO_2 , 5,200 t/year of NO_2 and 780 t/year of dusts, with a resulting overall impact on the power plant of 156,000 t/year of SO_2 , 20,800 t/year of NO_2 and 3,120 t/year of dusts".

The prosecution's case in the first criminal proceedings was that the defendants – in particular Mr. Scaroni – were accused of having allowed the Power Plant to be operated using fuel "with a high sulphur content instead of fuel with less impact ... (the percentage of sulphur in the fuel oil used varied between 3% and 1% but was in any event higher than 0.25%)" (...) "also failing to observe the positive duty to take all the best technical and organisational measures available and updated to the latest technological advancements – to prevent and contain these emissions and the resulting environmental damage (the so-called principle of best available technology ...)"²; "and of acting in violation of Art. 30 of the Regional Law of Veneto no. 36 of 08/09/1997 and of Art. 25 of the subsequent Regional Law of Veneto no. 7 of 22/09/1999 ... which required electricity generating plants, such as these, in the area of the Parco Delta del Po, to be fuelled with natural gas or other non-polluting alternatives – i.e. without high SO_2 emissions – with the obligation of submitting conversion plans for such plants to the Park Authority within 12 months after the law came into force, as well as [acting in violation of] the subsequent Regional Law 99/36 (published on 26/02/1999 in the 18/99 edition of the BUR [Regional Official Journal]) which required such plants to be fuelled with natural gas or other alternative sources with equal or lower impact on the environment – i.e. without significant SO_2 emissions – with the obligation to submit conversion plans for such plants to the Park Authority within 18 months after the Law as amended came into force"³.

It is therefore quite clear that the actions and omissions alleged in the first proceedings are the same as mentioned in the current heads of indictment. That said, it should be noted that the decision of the Court of Adria has established some facts which are incompatible with the submission for conviction put forward by the Public Prosecutor against Mr. Scaroni.

¹ See Ch. A of Criminal proceedings no. 3577/01 R.G.N.R. Note that, in the other heads of indictment, there was an express reference to the actions and omissions described in Ch. A.

² See Ch. A of Criminal proceedings no. 3577/01 R.G.N.R.

³ See Ch. A of Criminal proceedings no. 3577/01 R.G.N.R.

The prosecution has in fact forgotten the findings of the single Judge at the first trial – although often referring to it, in its own summing-up – who in his decision of 31 March 2006, on the point not challenged by the Public Prosecutor and therefore irrevocable, upheld as follows: "as regards Scaroni, he became Managing Director on 24.5.2002; therefore, he is not responsible for the strategic and business decisions taken up to that year. In particular, he did not participate in the preparation of the conversion plan for Porto Tolle, which caused the postponement of the environmental planning decided upon in 1994 and proposed conversion to orimulsion. Therefore, Scaroni cannot be held responsible for the decisions which resulted in the Power Plant at Porto Tolle being non-compliant at the end of 2002 and which led to the introduction of the laws which extended its operation",44.

As a result, this person [Mr Scaroni] was acquitted, in respect of the period from May to December 2002, **because he had not committed the acts** relating to the offences under Ch. C and A (referring to the oil spillage incidents). Similarly, Mr. Scaroni was acquitted of the offence of causing damage referred to in Ch. B⁵.

Indeed, it was stated several times in the cited decision that, as regards 2002, Mr. Scaroni "did not take the strategic decisions, particularly regarding fuel use, maintenance levels, emission prevention tools ... since these are strategic decisions to be imputed against the previous management".

In essence, the decision of 31 March 2006 of the Court of Rovigo, Separate Chamber of Adria – on the point covered by *res judicata* insofar as it was not challenged by the Public Prosecutor – has ruled out any liability by Mr. Scaroni for the emissions in 2002 and in the years before that date.

Consequently, Mr. Scaroni must be pronounced acquitted of the offences referred to in Arts. 437, paras. 1 and 2, c.p. and 434, paras. 1 and 2, c.p. in relation to the "facts alleged from 1998 until 31/12/2002".

⁴ See p. 245 of the decision.

⁵ It should be noted that for all the remaining alleged offences under Ch. A, D and E, Mr. Scaroni was acquitted for lack of grounds for the offence. Mr. Scaroni was therefore convicted only for the offence relating to the "deterioration of emissions" (Ch. C) and only in 2004. The Public Prosecutor did not submit an appeal against this decision, which is therefore *res judicata* in respect of the pronounced acquittal of Mr. Scaroni. Moreover, the Court of Appeal of Venice also acquitted Mr. Scaroni of the offence of deterioration of emissions in 2004 because he had not committed the offence. The decision was subsequently quashed by the Supreme Court with a simultaneous declaration that the proceedings had become statute-barred.

⁶ See p. 247 of the decision.

2. The request for conviction against Mr. Scaroni for the offence under Art. 434, para. 1, also for the period after May 2005.

The extension of Mr. Scaroni's liability alleged by the Public Prosecutor to the period after May 2005, because of the supposed permanence of the offence under Art. 434, para. 1, c.p., should also be examined on a preliminary basis, in order to determine precisely the extent of the allegations that will be dealt with hereunder.

Disregarding the fact – though we cannot see how this is possible – that in the heads of indictment the individual defendants are accused, under Art. 434 para. 1, c.p., of offences "limited to the periods when they were responsible" and therefore for "Scaroni from 24/05/2002 to May 2005", we cannot agree with the Public Prosecutor's theory on this point. As far as the permanence of the offence under Art. 434, para. 1 is concerned, the Public Prosecutor, in pages 416 and 417 of his summing-up, states: "in relation to the offence relating to the healthiness of the environment under Art. 434, permanence ceases to exist when the danger to the health of the population ends: in this case the thermoelectric power plant continued to emit substances into the atmosphere which were harmful to the health of the surrounding population by operating a plant which was not made environmental-friendly until mid-2008". In essence, according to the alleged offence – which, as you will see below, is disputed root and branch – the danger under Art. 434, para. 1, c.p. remained for as long as the Power Plant remained in operation.

From this perspective it is obvious that, starting from the moment when he ceased to hold office in Enel, Mr. Scaroni cannot be held liable for an event resulting from the operation of the Power Plant at Porto Tolle.

This is because from May 2005 he could no longer exercise any (even theoretical) influence over the operation of the Power Plant or its emissions.

In other words, Mr. Scaroni cannot be expected to answer for an event (danger to the population) caused by a source (the emissions of the Power Plant) which is completely outside his area of activity.

In these circumstances, we will only address below the charges for the years 2003-2004 and the first few months of 2005.

I. The general claim that all the emissions from the Power Plant were unlawful.

Before addressing the individual allegations it is worthwhile repeating that the assumption of the Public Prosecutor, according to which all emissions from the Power Plant are unlawful and therefore operating it should be deemed "outside the law", cannot in any way be upheld.

Even the Court of Adria – supporting the arguments of the defence – did not agree with the prosecution's radical assumption, confirming emphatically a principle which, indeed, seems unarguable.

"Although it may seem obvious, we advance a concept: that every industrial activity is polluting, but in balancing opposing interests, which is the duty of the law-maker, certain amounts of emissions are permitted and this is considered to be the meeting point between the conflicting demands of protection of the environment and industrial production at compatible costs"; therefore "not every emission from the Power Plant should be considered as a source of potential damage".

That said, it is common ground that the Power Plant of Porto Tolle has always complied with the emission limits which the legal system imposed on its operation.

This is recognised even by the Public Prosecutor's own consultants who have stated several times that "the emissions of the Power Plant" (...) "are within the limits of the law⁸. This fact was also confirmed by the technical advisor Prof. Pasquon⁹.

In this regard, it should be remembered that the deadline for adapting the Power Plant of Porto Tolle to the criteria of Ministerial Decree no. 203 of 12 July 1990 was duly set at 31 December 2002, and this is recognised by the Public Prosecutor's own expert witnesses, Rabitti & Pini¹⁰.

With particular reference to the position of Mr. Scaroni the following must then be pointed out.

A few months after his appointment as Managing Director of Enel S.p.A., the

⁷ See pp. 215 and 216 of the decision.

⁸ See Pini – Rabitti, "*Technical Consultancy Report of January 2004*", p. 57. See also the slides lodged on 16 November 2005 during the trial held at Adria, which are among the files of this proceeding.

⁹ See p. 19 of the technical consultancy report of Prof. Pasquon (Emeritus Professor of Chemical Plants at the Milan Polytechnic).

¹⁰ See Pini – Rabitti, "Technical Consultancy Report of January 2004", pp. 20 and 21.

Company informed the National Grid Operator "that with effect from 1 January 2003" sections 1, 2 and 3 of the Power Plant of Porto Tolle "could no longer operate".

In view of this communication, Legislative Decree no. 281 was promulgated on 23 December 2002, which expressly provided for the possibility of maintaining the thermal power plants of Porto Tolle, North Brindisi and San Filippo del Mela in operation (the latter two not owned by Enel) as an exception to the time limits set in the Ministerial Decree of 12 July 1990 according to a plan prepared by the National Grid Operator¹².

This piece of legislation was enacted "... taking into account the needs expressed by the National Transmission Grid Operator in order to maintain the power plants at Porto Tolle, North Brindisi and San Filippo del Mela in service, in order to avoid the danger of repeated disruptions in the supply of electricity, considering the extraordinary necessity and urgency of ensuring the safety of the national electricity system and avoiding any disruption in the coverage of its energy requirements...".

The Legislative Decree in question was not passed into law within the expected time limit. Therefore, a new Legislative Decree was issued (Legislative Decree no. 25 of 18 February 2003, passed into Law no. 83 of 17 April 2003)¹³.

After the latter piece of legislation, an Inter-Ministerial Decree was issued on 13 June 2003 approving the "Transitional Plan for Use of the Power Plant" and allowing Sections 1, 2 and 3 to operate until 31 December 2004, with specific limits in terms of output and emissions.

In particular, with regard to SO_2 emissions, the use of a "fuel with a sulphur content not exceeding 1%" was decreed¹⁴.

These limits have always been complied with 15.

From the regulatory provisions stated above, it is clear that the operation of the Power Plant was driven by national requirements, at the express request of public entities other than Enel¹⁶.

¹¹ See witness Mr. Urbani, on p. 33 of hearing transcription of 25 November 2013.

¹² See annex no. 45 to the technical report by Prof. Pasquon.

¹³ See annex no. 52 to the technical report by Prof. Pasquon.

¹⁴ This situation is also recognised at p. 3 in the technical report by Ispra for the Ministry of the Environment.

¹⁵ See the decision of the Court of Adria which acquitted all the defendants of the offence under Ch. E. *Res judicata* was created on this point, since it was not challenged.

¹⁶ See, for example, the letter of 30 April 2003 from the G.R.T.N. [National Transmission Grid Operator], referred to in

And it is frankly inconceivable to consider the activities of the Power Plant, in the years of interest to these proceedings, as simply being "unlawful".

In this respect we should add a further consideration.

In its decision of 31 March 2006, the Court of Adria acknowledged that until 1992 "the Power Plant was operated lawfully on the basis of the simple application for authorisation, so that one could say, as pointed out by the defence, of emissions which albeit not authorised were at least 'consented'¹⁷. It also states that since 1 January 2003 "Enel has been authorised to make emissions as an exception to Ministerial Decree of 12/07/1990"¹⁸.

The only emissions that the Court of Adria considered unlawful were the ones that resulted in the conviction of the offence referred to in Ch. C (the so-called 'deterioration of the emissions').

In other words, those emissions are unlawful which the Court of Adria has identified "in the difference between polluting substances which the Power Plant may release into the air and those which, unlawfully worsening emissions, have instead been released as a matter of fact" 19.

The defence challenged the existence of the so-called offence of deterioration of the emissions, as shown in the reasoning part of the judgement of the Court of Appeal of Venice where the respective positions held by the parties are described²⁰.

However, the issue about the existence of the challenge in question was not addressed by the Court of Appeal of Venice which stated expressly: "the acquittal of Tatò and Scaroni for not having committed the acts relating to all the conduct attributed to them exempts one from addressing the subjects relating to Ch. C concerning the temporary deterioration of the average values of the emissions, for which only the Managing Directors had been convicted"²¹. It is therefore clear that, on this point, no final res judicata could have been formed since the Supreme Court could not address the merits of the case, thus acting in place of the Court of Appeal.

the 13 June 2003 Decree by the Minister of Productive Activities, with which the proposal for the use of certain sections of Enel Produzione's thermoelectric power plants in Porto Tolle and of Edipower's in Brindisi was put forward.

¹⁷ See p. 34 of the decision on the single-judge Court at Adria.

¹⁸ See p. 36 of the decision on the single-judge Court at Adria.

¹⁹ See p. 216 of the decision on the single-judge Court at Adria.

²⁰ See pp. 19 et seq. and 51 et seq. in the judgment of the Court of Appeal of Venice of 25 May 2009.

²¹ See p. 107 of the judgement of the Court of Appeal of Venice.

Among other things, this Supreme Court has declared, "the comments made here would require the Court to quash the judgment, referring the case to the trial court for a new trial, particularly in view of the existence of the charged offences under Ch. A, B and C, in terms which will be addressed with reference to the positions of Messrs Busatto and Zanatta"²².

This further confirms that one cannot speak of a "res judicata" when referring to the so-called offence imputed to Mr. Scaroni of deteriorating the emissions.

But, regardless of this, it should be clear that – despite not agreeing with the interpretation of the rule given by Court of Adria – even if it were to be decided that a part of the emissions of the Power Plant may be relevant under criminal law to be unlawful for infringement of Arts. 13, para. 5 and 25, para. 7 of Presidential Decree 203/88, this fact does not have any impact on the subject matter of the present proceedings.

In fact, an infringement of Art. 13, para. 5 of Presidential Decree 203/88 does not of itself involve the endangerment of public safety²³.

Clean air and consequently public health are instead protected by regulations that establish limits that apply to the entire national territory²⁴.

In other words, if, on one hand, the alleged infringement has enabled the Court of Adria to exceed the limit provided for by the minor offence under Art. 674²⁵ ("in cases not permitted by law"), on the other, it does not mean that "worsening" emissions represents a danger to public health. Given this, and for the mere sake of defence, it should be noted again that the Court of Adria held Mr. Scaroni responsible only for a modest deterioration which occurred in 2004, while he was acquitted of the offence of deteriorating the emissions for 2002 and 2003.

II. The offence under Art. 437, para. 1, Penal Code.

The failure to deploy plants and equipment designed to prevent disasters and/or

²² See p. 27, point 4.3, judgment of the Supreme Court of 11 January 2011. As it can be seen, there is no reference to the existence of the only offence with which Mr. Scaroni is charged.

²³ See Giampietro "Versamento pericoloso di cose" [Harmful Spillage of Things] in Enciclopedia del Diritto [Encyclopaedia of the Law], XLVI, Milan, 1993, p. 645, according to which the limits to the emissions which may be produced by factories under D.P.R. no. 203/88 "impose an obligation of means and not of results, since they were not designed to provide protection for the safety of persons ..."

²⁴ See Giampietro "Versamento pericoloso di cose" in Enciclopedia del Diritto [Encyclopaedia of the Law], XLVI, Milan, 1993, p. 645.

²⁵ See p. 200 of the decision of the single-judge Court at Adria.

accidents at the workplace has been identified by the Public Prosecutor in the following negligent conducts.

1. The Power Plant of Porto Tolle had been operated and continued to be operated "with heavy fuel oil with a sulphur content (percentage of sulphur in

the fuel oil used, which varied between 3% and 1% but was in any event higher than 0.25%) without deploying plants and equipment and/or adapting existing plants to reduce emissions ..." In essence by operating the power plant "without inserting any additional devices to reduce SO2 emissions".

- 2. It had in any event used "fuel with a sulphur content in excess of 0.25% worse and with a greater impact on the environment than other available fuel".
- 3. Finally, it had failed "to request and require the conversion of the plant in the manner and within the time limits provided for by Regional Law of Veneto no. 36/97, which required fuelling with natural gas or other alternative non-polluting sources ... as well as in the manner and within the time limits provided for by Regional Law of Veneto no. 7/99 (BUR [Regional Official Journal] no. 18/99), which required fuelling with natural gas with other alternative sources of equal or lower impact on the environment ...".

On a preliminary basis, it is necessary to verify whether the case provided for by the rule in question may, even only in abstract, be applied in this case. On this subject we observe the following.

a) In the context of crimes against public safety, Art. 437 c.p. takes as its specific objective the safeguarding of health and safety at work.

Based on this, a body of case law has been built up aimed at revealing that the rule's scope of application is **limited exclusively to the workplace**.

Since the 80's this principle has indeed been confirmed, according to which "the criminal law provision regarding removal or wilful omission of precautions against accidents at work, is intended to safeguard the public safety in the workplace, as a consequence only persons employed in the workplace are considered [by such law provision] and not an indefinite number of persons outside the said environment. The aim to prevent accidents at work limits, in fact, the scope of application of the rule to the workplace, as the place where an accident may occur, being of no relevance if a disaster which involves the work environment may also affect the external environment. Therefore, the

danger caused by omissive conduct must be referred to the work environment and to a collection of workers, understood as being a sufficient number of people for an indefinite extension of the danger"26.

This has been reaffirmed, recently, by the Supreme Court which upheld that "both the heading of the criminal law provision and the first paragraph of the provision refer to accidents at the workplace and it does not seem to reflect the rationale of the provision to consider that such type of criminal offence aggravated by the event might concern accidents other than those provided for under the profile of risk in the relevant basic criminal offence"²⁷.

Moreover, the Supreme Court also noted that "the legal right protected by the provision of Art. 437 is health and safety at work"²⁸.

This principle was recently also affirmed by the Court of Review of Taranto (the Ilva case) – which, among other things, showed **the relationship of specialisation that exists between the provision under Art. 437, para. 2, c.p. and that of Art. 434, para. 2, c.p.** ²⁹ – according to which "the aggravating circumstance provided for by Art. 437, para. 2, c.p. (occurrence of an accident or disaster caused by the removal or wilful omission of precautions designed to prevent them) is configurable only when accidents or disasters have occurred in the workplace in which precautions were not taken, and not when they took place elsewhere".

Moreover, the Supreme Court, to clarify that the crime in question may also occur in case of illness, stated: "'occupational diseases', meaning those morbid syndromes attributable to the damaging action of agents other than those

²⁶ See for example Supreme Court, Sect. I, 81/3374; Supreme Court., Sect. I, 4 November 1995, no. 10951.

²⁷ See Supreme Court, Sect. I, 22 February 2007, no. 7337, Volpe.

²⁸ See Supreme Court., Sect. I, 24 April 2008, no.17214.

²⁹ See Court of Review of Taranto, Holiday Section, 7 August 2012. "For the crime of wilful omission of precautions against accidents at work challenged under (c)" (...) "among the assumptions described in para. 2 of the provision under examination and of Art. 434 c.p., there is a reciprocal relationship of specialisation". The existence of a relationship of specialisation between the two rules – in the sense that where the existence of the offence under Art. 437 c.p. is proven, no conviction is also possible for the offence under Art. 434 c.p. – is a principle which has also been upheld by the Court of Appeal of Milan (see judgment of 14 May 1985, published in 'Criminal Defence' in 1985, p. 57) which established the following: "where the wilful intent to commit the offence under Art. 437 c.p. is deemed to exist (intentional omission of accident prevention precautions) this offence absorbs the wilful disaster under Art. 434 c.p., in the aggravated form provided for in the sub-paragraph of the same Art. 437."

of a mechanical-physical nature, **provided they occurred when working**, fall within the same scope as accidents" ³⁰.

b) It should also be pointed out that the case law is consistent in holding that the plants and equipment that are assumed to be intentionally removed or not provided must serve real **accident prevention purposes**.

In other words, while it is true that the removal or wilful omission relates to equipment which may well fulfil purposes other than accident prevention, it is however **necessary** that such safeguards **also serve accident prevention purposes**³¹.

In essence, the device in question must unarguably have "accident prevention potential" 32.

Given the above, it is perfectly obvious that the facts described in the head of indictment for the offence under Art. 437 c.p. – even though, as we shall see later, they are unproven – cannot be included within the framework envisaged by the provision under examination.

First, both the event complained of (the increase in hospital admissions for children living in the Municipalities neighbouring the Power Plant) and "the danger of the occurrence or aggravation of respiratory diseases" (...) "as a result the inhalation and ingestion of pollutants" (...) "among the population in the areas surrounding the Thermo-Electric Power Plant, particularly children aged between 0-14 years..." do not concern either the work environment or the community of workers, as envisaged vice versa by the provision in Art. 437 c.p. Second, the accident prevention safeguards which are assumed to have been omitted (i.e., equipment which helps remove nitrogen oxides and sulphur oxides, dust and other pollutants contained in the emissions of the Power Plant, not to mention the use of methane or sulphur-free fuel) do not in fact serve any purpose for the prevention of accidents at work or occupational diseases.

³⁰ See Supreme Court., Sect. I, 9 July 1990, Chili published in *Giust. Pen.* 1991, II, 15; Supreme Court, Sect. I, 20 November 1998, Mantovani, published in *Diritto Penale e Processo* 1999, 293.

³¹ See Supreme Court, Sect. IV, 17 May 2006 no. 4675.

³² See Supreme Court, Sect. I, 20 April 2006, no. 20370.

On this subject we should recall the technical report of Prof. Pasquon, which concluded that "the actions mentioned in the Court's decision to start the proceedings cannot be included among the accident prevention equipment or safeguards for the health and safety of the workers". Moreover, according to the expert, "the nature of the fuel used in thermo-electric power plants (methane, fuel oil or coal) is irrelevant for the purposes of the quality of the workplace environments"³³.

In fact, the equipment referred to in the head of indictment, aimed at "limiting sulphur and nitrogen oxides, dusts and other pollutants" was not provided to protect the health and safety of workers, nor to prevent accidents at work or the occurrence of occupational diseases.

Moreover, as pointed out by Prof. Pasquon, "the plants/systems, described above, make it possible to eliminate/reduce pollutants not in the workplace but in the exhaust fumes sent to the chimney. As in all thermo-electric power plants, the chimney of the power plant at Porto Tolle is very high (250m) ³⁴. The characteristic "plume" of smoke (hot, to help it rise) goes upwards for tens of metres and enables pollutants to be dispersed in very low concentrations in areas kilometres away from the power plant and stops them falling back down on the workplace of the thermo-electric power plant, as it is clear from all the data available"³⁵.

Further confirmation, on a technical level, of the fact that the safeguards aimed at curbing emissions of nitrogen and sulphur oxides, dust and other pollutants

³³ See p. 49 of Prof. Pasquon's technical report.

³⁴ The point concerning the height of the chimney and the mechanism for dispersing emissions into the atmosphere will be covered again and further developed hereunder.

³⁵ See p. 48 of Prof. Pasquon's technical report. Incidentally, the emphasis expressed in the Public Prosecutor's summing-up according to which it must be inferred from Art. 2(n) of Legislative Decree 81/2008 that the labour regulations require not only the protection of the work environment but also the external environment, is devoid of any legal basis. Indeed, where such provision defines accident prevention "as the whole set of provisions or measures necessary to prevent occupational risks in the interest of the health of the population and the external environment" it is intended only to highlight that the measures that must be taken to prevent or reduce the risk to the health and safety of workers "must be adopted in the interest of the health of the population and the external environment". In other words, the rule in question states that one may not protect the health and safety of workers to the detriment of the health of the population and the external environment (see 'Testo Unico della Salute e Sicurezza nei Luoghi di Lavoro – Commentario al Decreto Legislativo 9 aprile 2008, n. 81' [The Consolidated Law on Health and Safety in the Workplace – a Commentary on Legislative Decree no. 81 of 9 April 2008], edited by Michele Tiraboschi, p. 138).

mentioned in the heads of indictment cannot be of any relevance for the protection of the workers' health and safety is also provided by another witness expert.

Prof. Giugliano, during the trial, in fact repeated that, "the technologies of abatement and purification (of emissions) are aimed exclusively at protecting the environment and certainly not the Power Plant or the workers or the employees of the Power Plant"³⁶.

The statement is consistent with the phenomenon of the dispersion of emissions into the atmosphere due to the height of the chimney and to the exit speed and heat of the smokes³⁷.

Prof. Giugliano, moreover, supported his own findings by stating: "SO2 is a gas, NOX is a gas, particulates which are dust" (...) "react to increases in atmospheric turbulence in all respects like a gas and therefore, for the reasons I mentioned before (i.e., this huge lifting up and then the subsequent dispersion in the atmosphere), there basically is no chance that these gases can affect the air quality at the Power Plant"³⁸.

On this point it should be noted that the claims – moreover completely logical and even intuitive – of the cited expert witnesses are not contradicted by any other evidence in the opposite direction, since the Public Prosecutor has not provided any opinion regarding the significance of the accident prevention safeguards (or indeed of the workers' health and safety protection) which, according to the prosecution, are held to have been omitted.

Incidentally, none of the Public Prosecutor's expert witnesses or the prosecution's witnesses has identified any risk of occupational disease for workers in the Power Plant associated with its emissions.

c) In view of the foregoing, one must also infer the non-existence of the subjective element required by the rule in question, which

³⁶ See the hearing transcriptions of 16 December 2013, p. 58.

³⁷ On this point, see the statements made during the trial by Prof. Giugliano at the hearing on 16 December 2013, reported below on p. 42.

³⁸ See the hearing transcription of 16 December 2013, p. 57.

requires awareness of the accident-prevention purpose of the equipment or devices which are assumed not to have been provided therein.

On this point, the Supreme Court has held that for the purpose of the existence of the wilful intent required by Art. 437 c.p. it is necessary "that the agent who may be charged with acting or failing to act must be aware that the precautions which he does not take or which he removes, are necessary (in addition to any other uses) to prevent the occurrence of harmful events (accidents or disasters) so that, if the conduct, albeit typical according to the description in Art. 437, is adopted without awareness that it is likely to create a dangerous situation, the wilful intent cannot be held to exist, which requires foresight of the consequences of the agent's conduct, even if these consequences are unintended but nonetheless accepted" 39.

In other words, the wilful intent required in the present case by Art. 437 c.p. must necessarily be "related to a precise awareness of the existence of a dangerous situation arising from the operation of a machine without any precautions and from the willingness to accept the risk of injury arising from running the machine without the required precautions"⁴⁰.

It is now obvious, precisely because of the comments made in the preceding points, that Mr. Scaroni could not envisage any danger for the workers.

In summary what was known at the time of these events was that:

- 1) The Power Plant was authorised to produce energy using the fuel which is the subject matter of the charges;
- 2) The limits provided for by the reference regulations for emissions had been complied with;
- 3) The height of the chimney made impossible the occurrence of any fallout of gas and dust from it within the perimeter of the Power Plant;

³⁹ See Supreme Court, Sect. IV, 6 February 2007, no. 4675.

⁴⁰ See Supreme Court, Sect. I, 24 April 2008, no. 17214, Avossa.

4) As you will see in the next section, there was no data on air quality in the areas surrounding the Power Plant to signal that the limits set by law for the protection of health and safety were being exceeded.

In light of the foregoing it must be concluded, therefore, that there are no grounds for the offence under Art. 437 c.p.

III. The offence under Art. 434, paras. 1 and 2, c.p.

a) The absence of danger to public safety.

First, we need to highlight some of the principles of law relevant to an assessment of the case at hand.

As noted by Constitutional Court judgment 327 of 2008, Art. 434 c.p. has the same "structural characteristics, with respect to the disasters covered in the articles included in the chapter relating to crimes of common danger by violence: a conclusion which is supported by the preparatory work for the code".

According to the Constitutional Court, therefore, "an analysis of all the offences included in Chapter I of Title VI enables a unitary notion of 'disaster' to be outlined, the qualifying traits of which can be evaluated in one two-fold and concurrent profile. On one hand, in terms of size, one must be in the presence of a destructive event of extraordinary proportions, although not necessarily huge, capable of producing serious, complex and extensive adverse effects. On the other hand, in terms of capacity to do harm, the event must cause — in accordance with the legal objectivity of these criminal cases in question ('public safety') — a danger to the life or physical integrity of an indefinite number of persons; however, without the necessity for real verification of the death or injury of one or more persons".

The Court then noted that "in the event described by Art. 434 c.p., the 'danger to public safety' – implied in the present case, as noted above, by the circumstance referred to in the second paragraph (occurrence of the 'disaster') – is expressly

required also in relation to the terrorist offence provided for in the first paragraph (execution of acts aimed at causing a disaster)".

That said, it is clear that the circumstances set out in the first paragraph of Art. 434 c.p. describe the offence of endangering public safety and is structured as an offence of real danger, where the occurrence of danger "is a constituent element of the case"⁴¹.

In offences of real danger, indeed, the conduct described by the law-maker does not exhaust the case: there is no danger at the level of the simple method or assessment of the conduct, but it rises to the level of independent essential component of the offence, which is essential for its consummation which, therefore, is added to the conduct.

In other words, to constitute the offence in question the threat of danger is not sufficient, but the actual occurrence of the danger to public safety must necessarily be found. It is therefore necessary to establish **actual and real danger** to public safety as a result of the conduct put in place by an active person⁴²; and this must be proven, in accordance with Art. 533 of the Code of Criminal Procedure ('c.p.p.'), beyond reasonable doubt.

In order to ascertain whether the offence referred to in para. 1 of Art. 434 c.p. exists, it is therefore necessary to make an assessment of the state of danger based on **evidence items which can be found in practice**, in order to avoid the assessment of theoretical danger and the assessment of real danger ending up coinciding and being confused with one other. The foregoing has been reiterated many times by the case law on legitimacy which, for the purpose of constituting the offence referred to in para. 1 of Art. 434 c.p., has stated: "it is necessary for a concrete situation of danger to public

⁴¹ See Supreme Court, Sect. IV, 25 February 2010, no. 7664, Pirovano.

⁴² On this point, legal scholars has stated that "with regard to both situations outlined in para. I, it is necessary for the completion of the act that the conduct has given rise to a danger to public safety. The Court must therefore determine whether, by executing an 'act intended to cause the collapse of a building or a part of it or another disaster', an actual risk of injury to public safety has arisen" (see Corbetta in Marinucci-Dolcini, Treaty, PtS, II, 1, 616; Gizzi, Codoppi-Canestrari-Manna-Papa, Pts, IV, 233). According to legal scholars, therefore, "the danger must be interpreted as an event which is essential to the act, related only by chance to the conduct which therefore falls within the scope of wilful intent" (Corbetta, in Marinucci-Dolcini, Treaty, Pts, II, 1, 617; Fiandaca-Musco, Pts, I, 515; Gizzi, in Cadoppi-Canestrari-Manna-Papa, Pts, IV, 230).

safety to exist", noting, among other things, that "from the point of view of evidence" the effectiveness of the capacity to distribute the harm "must be demonstrated in practice" 43.

In light of the above principles we now come to an analysis of the evidence.

The Public Prosecutor and the plaintiffs have long insisted on the amount of emissions produced by the Power Plant, highlighting the dangers to health and the environment of the pollutants contained therein.

It is, however, a serious methodological error to confuse the emissions of pollutants into the atmosphere with the immissions thereof into the ground, since it is only the latter which – theoretically – may cause danger to the health of the resident population and, more broadly, to the environment.

On this subject we must first recall the precise explanations of the expert witness, Prof. Giugliano (Full Professor of Atmospheric pollution at the Polytechnic of Milan and Head of the Laboratory of Environmental Engineering of the Polytechnic of Milan).

In his technical report, Prof. Giugliano has clearly explained that "faced with major emissions from a large industrial source, the perception of non-specialists tends to imagine disastrous situations in the surrounding area. In actual fact, the levels of concentrations of pollutants in the soil is strongly dependent on the altitude at which the pollutant itself is released. The geometric height of the chimney, 250 metres in this case, is always added to the further lifting effect of the plume which, thanks to the speed at which the smoke escapes (over 100 km/h at full load) and at a temperature which is considerably higher (140° C) than the surrounding air (hence a strong buoyancy effect), can go from about once to about 8-10 times the geometric height of the chimney, to reach, in this case, results ranging from 400-500 metres up to 2,000 metres. The mathematical models predict, roughly, that the maximum concentration at ground level of a pollutant emitted

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⁴³ See Supreme Court, Sect. IV, 14 March 2012, no. 18678; Supreme Court, Sect. IV, 15 December 2011, n. 6965; See Supreme Court, Sect. IV, 15 October 2009, no. 7664, Pirovano; Supreme Court, Sect. IV, 20 February 2007, no. 19342, Rubiero; Supreme Court, Sect. V, 11 October 2006, no. 40330, Pellini.

from a source point at high altitude is, on average, diluted by a factor equal to the square of the height at which the pollutant itself is released.

This means that, if the height of the emission point is for example 500 m (a typical case), the concentration with which the pollutant emitted from the chimney reaches the ground, at the point of maximum fallout, is diluted, on average, by 250,000 thousand times (500 x 500). However, it may happen that atmospheric stratification forces the plume to spread out in a restricted layer of atmosphere of some hundreds of metres (mixing layer), with the effect of increasing concentrations on the ground. However, this is a characteristic problem of emissions at low altitude (traffic, urban heating, low chimneys). In this case, the geometric height of the chimney added to the lifting effect is such as to always be able to pierce the low altitude mixing layers, which typically cause many problems for air quality. And in cases where the plume of the power plant, although emitted at altitude, remains trapped in a high altitude mixing layer, it means that in this case the layer is still sufficiently high to allow adequate dilution of the emissions (Fig.3.4).

The statistical analysis of meteorological data and of the lifting effect of the plume, produced on a monthly basis by the CALMET-CALPUFF modelling system for this case, enables us to show that, for a very large part of the year, the plume exceeds the mixing layer, reaching an average of about 300 metres above it from October to March and 150-200 metres above the mixing layer, from April to September" (...) "it is not at all surprising, therefore, that even in the presence of significant emissions, such as those from the Thermo-electric Power Plant in question, the air quality limits for the protection of human health and of the vegetation in the surrounding area are complied with. And there are two main reasons for this:

1. The height of the power plant's chimney (250 m) and the subsequent average lifting up of the plume result in a point of emission at higher altitude, which enables the pollutant to be distributed over a very large area, with a consequent reduction of concentrations in the soil, particularly near the plant;

2. Models which estimate the distribution of the pollutant, after being emitted into the atmosphere, indicate that, for hot emissions at an altitude, only part of them have an impact on the surrounding area and this is modest, whereas the remainder, with low concentrations, affects places which are even thousands of miles away (...)"⁴⁴.

The same idea was expressed by the expert, Prof. Pasquon 45.

See also annex no. 1 to the technical report of Prof. Pasquon, namely the "Technical Report Prepared in Accordance With and For the Purposes of Arts. 12, 13 and 17 of Presidential Decree 203/1988" in 1989. At a time much earlier than the beginning of this trial, it was stated, with reference to the dispersion of the fumes from a power plant chimney, that, "due to the amount of the motion, and even more to the heat content of the fumes (mass, temperature and specific heat), the products of combustion are dispersed, on average, at variable rates of about 4-5 times the height of the chimney, resulting in significant geometric dispersion and dilution of the fumes".

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⁴⁴ See pp. 19, 20 and 21 of the technical report. See also, on this point, the statements in argument made by Prof. Giugliano at the hearing on 16 December 2013: "Dispersion for large plants in particular, especially, let's say, in the early 2000s was an important juncture in the sustainability of these types of plants because a series of measures were applied which would regulate very efficiently the dilution of these pollutants in the atmosphere. The two events, let's say, which create this massive phenomenon of dilution are, in the first instance, the rise of the plume, so the emission in fact does not start at 250 metres, which is the actual height of the chimney, but the plume, thanks to the important carrying power of the smoke, to the amount of waste gas that escapes, in a fraction of time for large plants, and thanks, above all, to the temperature, because often there are clever tricks from the heating of this smoke which enables it to rise with buoyant force and this normally doubles, triples or quadruples the geometrical height of the chimney, so that, in the case in point, the plume does not start at 250 metres and goes away, blown by the wind and then dispersed, but starts from 500, 750, 1000 metres and higher. However, after that, once it has reached its maximum height, it is subject to another important phenomenon which, we say, is fundamental for dilution, and this is atmospheric turbulence, when, blown by the wind, the plume is transported in one direction, but we all know that while it is being transported the plume spreads out, so the spreading out of the plume is due to these whirlwinds, lets' say, in the atmosphere, i.e. atmospheric turbulence, which greatly dilutes the concentrations. So to give you an idea, just to understand the effects of this phenomenon, let's say, a rule of thumb that, however, is duly confirmed by the models, a chimney of 250 metres which then undergoes say a further increase up to 500 metres results in a dilution of pollution at ground level, so when the edge of the plume, because the plume spreads out and then sinks to the ground, is diluted 500 metres x 500 meters, that is, 250,000 times, thus it is no surprise if we measure, let's say, we have, for example, 2,000 milligrams per normal cubic metre at the point of emission, at ground level we find maximums of a few micrograms per cubic metre" (See hearing transcript of 16 December 2013, pp. 55 et seq.).

⁴⁵ See p. 48 of Prof. Pasquon's technical report: "As in all thermo-electric power plants, the chimney of the power plant at Porto Tolle is very high (250 m). The characteristic "plume" of smoke (hot, to help it rise) goes upwards for tens of metres and enables pollutants to be dispersed in very low concentrations in areas miles away from the power plant".

It is therefore obvious that the repeated references by the Public Prosecutor and the plaintiffs to the high level of emissions from the Power Plant are, on one hand, intended only to make a striking impression and, on the other, betray the weakness of the prosecution's case.

In order to affirm the validity of the indictment, it is in fact necessary to show that the immissions (not the emissions!) coming from the Power Plant have resulted in significant pollution in the area, such as to entail a real and effective danger to public safety provided for by the offence under Art. 434 c.p.

It is therefore necessary to determine, in practice, by examining data from measuring instruments required by the legal system, whether at the time of the facts in the indictment – from 1 January 2003 to May 2005, with reference to Mr. Scaroni's position – there existed a situation of real danger to the public safety required for the existence of the offence in question⁴⁶.

The deposition of Prof. Giugliano and his technical report are, on this point, a key part of this trial.

In this report, the expert witness has, in summary, introduced a number of objective factors of fundamental importance to the decision.

Prof. Giugliano, specifically, highlighted the following.

"Since there are reasonable concerns for the health of the populations exposed whenever the air quality limits are exceeded or there are evident risks of them being exceeded, the primary objective of every investigation is precisely to verify compliance with these limits.

As far as macro pollutants are concerned (SO_2 , NO_x and dust) are concerned, the basis of the data effectively measured, which could constitute a far more appropriate reference for the epidemiological analysis is extensive in terms of time and space. The data measured in various ways by fixed and mobile stations

⁴⁶ On this point, it should be noted that the subject of air quality was not the purpose of the criminal proceedings held before Court of Adria. On page 215 of the judgment of 31 March 2006 one can read: "it must be clear that the quality of the air is not a matter of direct relevance in these proceedings: there are no allegations of violations of the relevant rules (and incidentally it can be said, indeed, that no such violations emerged) and their relevance is only indirect, to infer from them circumstantial evidence of the existence of damage to the environment. It is therefore unnecessary to conduct a detailed examination of the findings in argument on a point which has been omitted".

which cover extensive portions of areas around the Power Plant for the periods involved are:

■ three ARPAV-Rovigo stations

- Pila, 1 km NNW of the thermoelectric power plant (mobile equipment working for limited periods);
- Polesine Camerini, 3 km WSW of the thermoelectric power plant (mobile equipment working for limited periods);
- Porto Tolle Ca' Tiepolo, 13 km W of the thermoelectric power plant;

\blacksquare two *ARPA-ER stations*

- Goro, 19 km SSW of the thermoelectric power plant (mobile equipment working for limited periods);
- Mesola, 22 km WSW of the thermoelectric power plant (mobile equipment working for limited periods);

■ *eight ENEL stations*

- Scardovari, 7 km SSW of the thermoelectric power plant;
- Ca Tiepolo, 13 km W of the thermoelectric power plant;
- Taglio di Po, 26 km WNW of the thermoelectric power plant;
- Massenzatica, 25 km WSW of the thermoelectric power plant;
- Lido di Volano, 25 km SSW of the thermoelectric power plant;
- Case Ragazzi, 22 km WSW of the thermoelectric power plant;
- Ca Cappello, 20 km NW of the thermoelectric power plant;
- Porto Levante, 13 km NW of the thermoelectric power plant;
- Measurements using a mobile laboratory for the years 2005 to 2009 (Rosolina, Scardovari, Porto Viro, Taglio di Po), various ARPAV investigations in the Podelta area.

Since we are talking about an area with a radius of approximately 25 km, it is logical to agree that it involves one of the most monitored zones in Italy with regard to the modest population, but entirely consistent with the type and size of the ENEL facility"⁷.

That having been stated, note the data supplied by the Enel power plants in the years 2000-2004.

⁴⁷See p. 8 of expert witness prof. Giugliano's technical report.

The table taken from the 2005 APAT (Italian Agency for Environmental Protection) Report filed by the plaintiff, the Ministry of the Environment, in this trial is given below.

	Postazioni								
Periodo	Scardovari		Taglio	Massenzatica			Ca	Porto	
		Tiepolo	di Po		Volano	Ragazzi	Cappello	levante	
	Concentrazione media di SO ₂ nell'anno considerato (µg/mc)								
2000	3	3	3	3	2	3	4	2	
2001	2	3	3	3	2	3	3	2	
2002	2	3	4	3	2	3	3	3	
2003	2	2	2	2	1	2	2	1	
2004	1	2	2	1	1	2	2	1	

Tabella 8.2: Medie annuali delle concentrazioni di SO2 misurate nelle stazioni di monitoraggio

Pag. 37

It is easy to understand how the average annual concentration levels of SO_2 measured by the eight Enel power plants are well below the average annual figure laid down in the regulations for the protection of ecosystems (20 micrograms per cubic metre)⁴⁸.

Petitida	Limits per affetti acusi.	Limits per affetti examici (pg m²)
1915 1983 20PW 122-79*54H-RU	. 740 /inelia II, III assentii	390 / meth di 24 into
1983 - 1988 (DPCM) 26/3/2968, 4(6))	246 (93) parameter helle sandle di 22 me in me manit	THE conclusion duffer searcher in the cost on the concern
1989 - 2402 (DPB 2017968 - 6717)	255 (197) presentale della sendre di 24 con nell'anno (99 (configuratella continuità 2) con un un asser- 130 (constante della continuità 2) con un un unoso)
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Moreover, it is the same expert witness of the Public Prosecutor Dr. Scarselli who, at the hearing of 23 September 2013 confirmed that, at the time of the events, "the concentrations of SO_2

⁴⁸See p. 2 of expert witness prof. Giugliano's technical report.

measured are in all cases very low, below the minimum levels requiring attention and close to the minimum threshold levels",49.

It is therefore undisputed that the air quality data provided by the Enel power plants have always been well below the legal limits required for the protection of the environment and human health.

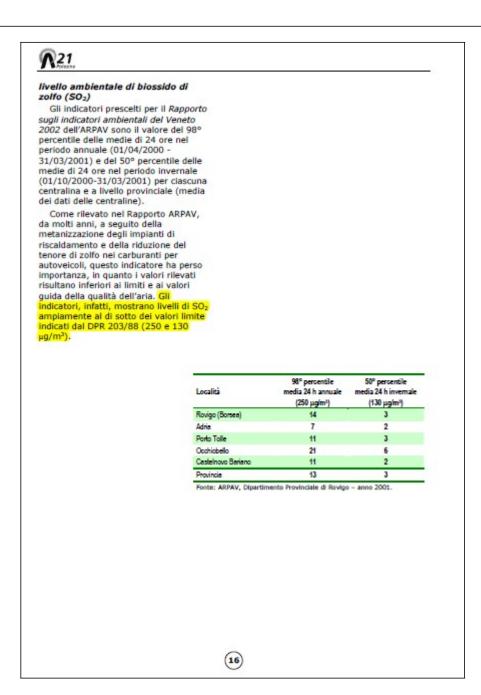
Moreover, nor did the ARPAV power plants ever show any type of criticalities with regard to health and, more generally, for the environment.

Firstly, note the "Report on the state of the environment and the community" in Agenda 21 Polesine⁵⁰.

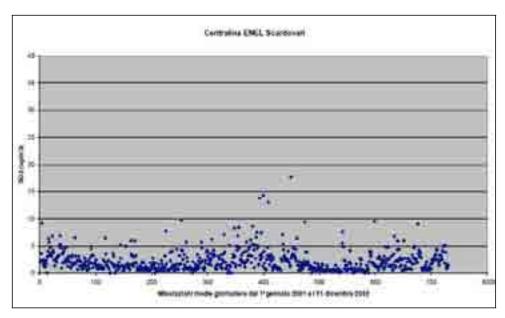
In this document it is stated that in the area concerned in 2001 "the indicators...show levels of SO_2 well below the limits indicated in D.P.R. (Presidential Decree) 203/88 (250 and 130 micrograms/cubic metre)" (in the table referred to in the report it can be seen how the SO₂ figures detected in Porto Tolle are more than twenty times below the maximum values required by the law-maker for acute effects).

⁴⁹ See p. 90 of the transcripts of the hearing of 23 September 2013.

See annex no. 4 of the expert witness Prof. Giugliano's technical report.



The table (contained in the report of the Public Prosecutor expert witnesses Pini and Rabitti of 2004) which demonstrates how the concentrations of SO_2 for the years 2001-2002 were hugely below the limits for the protection of human health is also given below.



ENEL-Scardovari power plant. Average daily concentrations of SO₂. Years 2001-2002 (excerpt from page 63 of Pini and Rabitti January 2004 *Expert witness technical report*, Criminal Proceedings no. 3577/01 and 2002/02).

Bear in mind that the above data refer to the **daily averages** and therefore demonstrate that the presumed daily peaks are greatly below the limit laid down by the law⁵¹, both for acute effects, which, at the time was 250 micrograms per cubic metre (98th percentile of the 24-hour averages in one year)⁵² and for chronic effects, which until that time was 80 micrograms per cubic metre (as the median of the 24-hour averages in one year)⁵³.

For later years (2003-2007) there is a further "Report on the findings relating to emissions into the atmosphere" drawn up by ARPAV in 2008.

⁵¹See table on p. 2 of the expert witness Prof. Giugliano's technical report.

⁵² To determine the 98th percentile of the 24-hour averages in one year it is necessary to sort the list of all the average daily concentrations resulting from one year of measurements in ascending order. The 98th percentile corresponds to the average daily concentration value, which in that list is in the position equal to 98% of the number of concentrations considered and ordered as above: i.e. it is the seventh highest daily average in a year (because seven days are 2% of 365).

⁵³ To determine the median of the 24-hour averages in one year, it is necessary to list all average daily concentrations resulting from one year of measurements in ascending order. The median (or 50th percentile of the distribution) corresponds to the average daily concentration value in the position equal to 50% of the number of concentrations considered and ordered as above. In other words, it is the daily average that is halfway between all the daily averages measured in one year.

This document states⁵⁴: "The aim pursued by the report is to provide a framework of the investigations conducted relating to the emissions produced by the Enel Polesine Camerini (Ro) thermoelectric power station and to carry out an in-depth analysis into the problems regarding the effects on health of the pollution produced by combustion processes originating from fossil fuels, as required by Veneto Region – Regional Management for Prevention – Public Hygiene and the Environment Division (Prot. 476815/50.03 0721 of 29 August 2007)"(...).

"The descriptive statistical analysis relating to the air quality in Porto Tolle, from 2003 onwards has been conducted, comparing the pollution levels with the limits for the protection of human health laid down in the regulations. The daily, monthly and annual pollution levels in Porto Tolle were then compared with those measured at the other monitoring stations in the Province of Rovigo and an area adjacent to the plant, which includes the provinces of Verona, Padua, Venice and Ferrara". (...) "Lastly, the relationship between the air quality at Porto Tolle and in the area adjacent to the power plant, with the various operating regimes of the power plant and the estimate of emissions produced was analysed".

The conclusions of the ARPAV report were as follows:

- "Over the years, the concentrations of pollutants recorded in the air at Porto Tolle were lower than the regulatory limits, with the exception of the number of exceeded values/year of the daily limit permitted for PM10 and annual concentrations of NOx. These parameters were similarly exceeded at almost all the stations in the Veneto Region.
- The average annual and monthly concentrations of PM10, NOx, NO₂ and SO₂ at Porto Tolle are **basically lower** than those measured in the other adjacent stations (Provinces of Rovigo, Verona, Padua and Venice).
- The average monthly concentrations of the various pollutants show **similar trends** for all the measuring stations adjacent to the thermoelectric power plant and in a wider area, **no significant irregular trends are noted.**

⁵⁴ See annex no. 7 of the expert witness Prof. Giugliano's technical report.

- The anemological regime at Porto Tolle is affected by the proximity of the sea, with more intense winds on average than those on the western plain, aiding the long-range dispersion of the smoke from the power plant.
- No macroscopic effects were detected for the emissions of the thermoelectric power plant on the levels of concentration of SO_2 , NO_x , NO_2 and PM10 measured at Porto Tolle and in the wider area investigated, such that would be apparent in the daily, monthly or annual averages analysed; for the average hourly concentrations, on the other hand, some concentration peaks of SO_2 which were rather significant were detected, **isolated in time**, in the area neighbouring the power plant and **below the regulatory limits**".

Moreover, the same Public Prosecutor expert witness Dr. Scarselli, in his report of 9 October 2005, could not avoid to acknowledge the following:

- "the A.R.P.A.V. 2004 air quality figures can be considered as indicative of a situation of **minimum impact of the power plant**, thereby constituting a useful reference for future monitoring";
- the PM10 concentration figures measured at Pila and Porto Tolle as from mid-2003 are within the legal limits and are comparable with those typical of non-urban areas...";
- "fairly marked fluctuations over a period of time for some elements are noted, but never strictly correlated either with the concentrations of PM10 or with the operating status of the thermoelectric power plant";
- "the heavy metals measured in the PM10 in 2004 are in limited concentrations, in line with expectations in not particularly polluted areas...".

There is a further document in the transcript of the trial produced by ARPAV called "Impact simulation modelling of the Enel thermoelectric power plant at Porto Tolle for the years 2000-2006 – Simulation modelling supporting the Rovigo DAP and required under the scope of proceedings no. 3946/08 General Criminal Records Registry".

The simulation, as can be read in the introduction of this document, was carried out at the request of the Public Prosecutor's Office of Rovigo: "The note of the

Public Prosecutor's Office (dated 1/3/2010 and registered under ARPAV protocol no.26391 of 4/3/2010 specifically requested "CALPUFF simulation modelling in relation to the areas surrounding the Porto Tolle power plant for a radius of 25 kilometres for the period 2000-2006 divided by year with regard to the furnace SME emissions data of macro pollutants (SO₂, NOx, dust) as well as micro pollutants…"

The results of the ARPAV study have been considered by Prof. Giugliano in his technical report and in annex 1 of same. This issue was also discussed during the interviews of the expert witness⁵⁵.

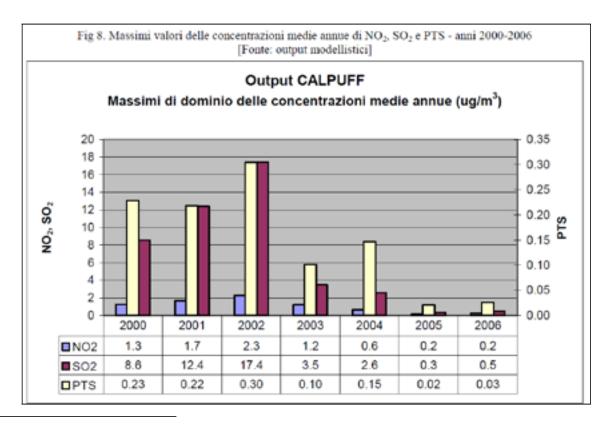
From the examination of the ARPAV investigation in question it emerges that – although the expert witnesses

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⁵⁵ See transcripts of the hearing of 16 December 2013, pp. 65 et.seq. note that, in this regard, as during the interview of Prof. Giugliano, the Public Prosecutor tried to challenge the statement of the latter, moreover comparing it with the results of the ARPAV investigation for a given year with regulations from a later period. The entire excerpt of the cross-examination of Prof. Giugliano is hereby copied: "Public Prosecutor ... So, is it not true that this CALPUFF modelling does not indicate, as you say, any exceeding of the limits protecting human health because the figures in this model for the years 2000, 2001, 2002 and 2003 which contain the KLRL absolute maximum hourly averages codes, K GIUGLIANO – Yes, I've seen them. Public Prosecutor – So, I put it to the Court that they contain figures where there is the daily maximum for the year and the fourth daily maximum for the year, I will explain for the panel, then the professor will correct me if I am mistaken, why do they contain the daily maximum for the year and the fourth one? Because the law makes provision that the daily limit for the protection of human health is, for example, 125 which should not be exceeded more than three times and so they show the first three values and the fourth value. In these figures which relate to the SO₂ there is exceeding according to the models, specifically the exceeding, for example, for 2000 of both the daily limit for the first and the fourth, the same goes for 2001 and the same goes for 2002, and this is something Scarselli spoke about as well as having filed the document. I should now like to show you this and ask you why do you say that those limits do not talk about exceeding ... GIUGLIANO – Because until 2002 those were the standards, not the ones from 2003 onwards, they were those of the 98th percentile of average daily concentrations as far as the limits of acute effects are concerned and for chronic effects there was a median, and the median of the averages of 24 hours and then there was the winter one. In April 2002 we incorporated European standards and therefore from 2003 those standards that you mentioned were valid from 2003 onwards. Public Prosecutor – However, professor, you know very well that the models are from 2000 to 2006 therefore your answer, if you would like to clarify, at least is not correct from 2003 to 2006 would you not agree? - GIUGLIANO - No, I said that they comply gradually with all the standards ..., let's say how they were structured over time. This is it. Public Prosecutor – Yes. So I would like to understand if you will go into more detail, whether, according to you, just give me a simple yes or no and then we will reflect on it in peace, according to the ARPAV modelling does this modelling comply with the figure in 2003 or in 2004 or in 2005? GIUGLIANO – Absolutely. Public Prosecutor – And in 2002 and in 2001? GIUGLIANO - In 2001 it complied with the standard that there was in 2002. Public Prosecutor - Which was? GIUGLIANO – That was the 98th percentile, 250 micrograms per cubic metre with regard to the value found by ARPAV of 219. I examined those figures carefully because that is then the gist of ARPAV taking into account that we have disputed, I dispute two elements of the weighting that ARPAV unduly used. And therefore, a fortiori, let us say, it complies with the standard" (see transcripts of hearing of 16 December 2013, pp. 90 et.seq.).

of the Regional Agency used "conditions which were very damaging for the purposes of the air quality on the ground"⁵⁶ – "the results of the modelling application never show any exceeding of the limits for the protection of human health that ensued over the years"⁵⁷.

For example – taking into consideration the weight attributed by the Public Prosecutor to the fine dust particles – figure 8 on page 8 of the ARPAV Simulation modelling is extremely interesting.



⁵⁶ See transcripts of the hearing of 16 December 2013, p. 67.

⁵⁷ See expert witness Prof. Giugliano's technical report, p. 5. Specific attention should be used in order not to be tricked by the words of Dr. Scarselli (referred to several times by the Public Prosecutor as well) according to which the ARPAV simulation models would, for the historical period 2000-2002, forecast an SO₂ value equal to 21 micrograms per cubic metre (see p. 4 of Scarselli-Crosignani report). In reality, said Dr. Scarselli, on p. 5 of the same report, refers, correctly, to the fact that the estimated value of the ARPAV simulation models of 21 micrograms per cubic metre relate to the 98th percentile of average <u>daily</u> concentrations of SO₂, while the tables above relate to average <u>annual</u> concentrations. It is helpful to remember than in 2002 the <u>regulatory limit</u> for acute effects laid down by the law was 250 micrograms per cubic metre (98th percentile of the daily averages), in other words more than ten times the estimated value of the ARPAV modelling. The <u>regulatory limit</u> for chronic effects for the protection of ecosystems and health was 20 micrograms per cubic metre (as an annual average), in other words a value approximately ten times higher than that measured by the ARPAV simulation models for the years in question.

The table contains the estimated values of the average annual concentrations of dust. In the same report (p. 7) ARPAV notes that the daily limit is 50 micrograms per cubic metre for PM10 of which 35 exceeded values are allowed in one year.

Now, the values (estimated by ARPAV) of the contribution to the ground for dust emitted by the power plant are between 200 and 500 times lower than the maximum value laid down by law: in 2002, 0.30 micrograms per cubic metre, in 2003, 0.10 micrograms per cubic metre, in 2004, 0.15 micrograms per cubic metre against a maximum for the safeguarding of human health of 50 micrograms per cubic metre.

From the ARPAV simulation modelling relating to the years 2000-2006 it can therefore be inferred that the power plant contributed to a very limited extent to the PM10 identified in the area in the years in question.

With reference to the vanadium - a heavy metal present in PM10 - the same Public Prosecutor, during the course of his summing-up, also believed it to be only a "trace" of the emissions of the power plant.

It is therefore out of sheer conscientiousness that it is noted how Prof. Giugliano referred to the results of the monitoring campaign conducted by ARPAV in the years 2003-2004 which recorded values of vanadium "on average 200 times lower than the limits laid down by the WHO".

The expert witness then referred to the campaigns conducted by the same expert witnesses of the Public Prosecutor in which there was no significant presence of vanadium in the ground, in the vegetation and in the water⁵⁹.

Prof. Giugliano then stated that "the contribution of vanadium to the environmental compartments examined appears modest and the reference limits for the quality of the air and the land, which represent the main routes of impact for the population exposed, were definitely never exceeded, nor were significant traces found on edible crops (vegetables) or in the water"⁶⁰.

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⁵⁸ See p. 22 of the expert witness Prof. Giugliano's technical report.

⁵⁹ See pp. 24 *et.seq*. of the expert witness Prof. Giugliano's technical report. Also see the full hearing, Prof. Giugliano, transcripts of the hearing of 16 December 2013, pp. 71 *et.seq*.

⁶⁰ See p. 29 of the expert witness Prof. Giugliano's technical report.

Moreover – still with reference to the vanadium – the Public Prosecutor expert witnesses also highlighted how the data relating to this metal identified in the 2003-2004 environmental monitoring campaign "were not such as to raise the alarm or give rise to serious concerns as far as current and recent effects on health and the environment are concerned".

In the light of these multiple and concordant evidentiary findings, the Public Prosecutor, overlooking the ARPAV power plant data and the ARPAV simulation models, refuted the data of the Enel power plants based on the studies of Dr Scarselli

This adversarial approach cannot be admitted for many reasons.

On the weighting that should be attributed to the lichenological investigations for the purpose of a definite and objective evaluation of the air pollution of a given site it is impossible not to agree with the observations of the expert witness Prof. Giugliano.

"In all the regulations that have succeeded one another, until the latest one, updated to include the most recent scientific knowledge about the sector (Legislative Decree 115/2010), it is constantly stressed that it is the measurements, through well-defined reference methodologies, that are at the basis of all monitoring body interventions.

Specifically, **risk situations for health resulting from the exceeding of the limits listed above**, which consequently trigger rehabilitation measures and mandatory reporting of the Ministry and the European Community by the local authorities, **should always and only be identified through measurements.**Therefore, when identifying the exceeding of the limits for the protection of health and the critical levels for the protection of vegetation, **no formal role is attributed to alternative detection techniques for air quality** (for example, **the lichen biodiversity index**), other than the measurement of the concentration of pollutant through certified methods and protocols indicated in the actual regulation" (...)⁶².

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⁶¹ See Scarselli-Magnani "Summary of the environmental monitoring campaign on the areas surrounding the Porto Tolle Thermoelectric Power Plant", p. 3.

⁶² See p. 3 of expert witness Prof. Giugliano's technical report.

"It can be concluded that the basic and irreplaceable knowledge to evaluate the exposure of the population to pollutant agents is the measurement of concentrations, carried out using recognised methods and compared with the reference values available from Italian regulations since 1983".

With regard to this point it is necessary to refer to what has been established in the ANPA Manual (National Agency for the Protection of the Environment) "Lichen biodiversity index 2001".

This manual expressly points out various limitations with regard to environmental biomonitoring. Among other things, it highlights the "difficulty in many cases of establishing an unequivocal relationship between biological data and atmospheric concentrations of specific pollutants as a result of the synergic effects caused by the presence of several toxic substances on some ecosystem components and the impossibility of processing biological data in terms of pollution valid for the entire country on a single interpretation scale, given the extreme variability of the climate and geomorphology it features".

In other terms, according to ANPA, "...given the substantial diversity of the information, it is obvious that the use of biomonitoring cannot be considered as an alternative to instrumental monitoring..."⁶⁴.

⁶⁴ See annex no. 2 of the expert witness Prof. Giugliano's technical report.

⁶³ See p. 4 of expert witness Prof. Giugliano's technical report.



- monitoring of the tropospheric ozone through the use of the *Nicotiana tabacum* plant (Lorenzini, 1999).

There are many other techniques, but they are almost all entirely experimental in nature (Piccini & Salvati, 1999).

Every technique that uses living organisms has both specific limitations and advantages to be considered with regard to the objectives and territorial scales.

The most frequent limitations can be summed up as follows:

- Difficulties, especially for methods that use autochthonous biomonitoring, in applications where the suitable growing substratum used is infrequent;
- difficulties, in many cases, in establishing an unequivocal relation between the biological data and atmospheric concentrations of specific pollutants as a result of the synergic effects caused by the presence of several toxic substances on some ecosystem components:
- a drastic decrease in the sensitivity of some techniques for extreme atmospheric concentration values of certain pollutants;
- the inability, in many cases, to immediately detect acute environmental alteration phenomena, because the reaction of the organisms requires a certain amount of time to be discernable;
- the impossibility of processing a single interpretation scale for the biological data in terms of pollution valid for the entire country, given the extreme variability of the climate and geomorphology it features.

The main advantages are:

- the possibility of obtaining an estimate of the biological effects produced on sensitive organisms by the interaction **of multiple harmful substances** quickly, at low cost and with a high density of sampling points;
- the rapid identification of areas with actual or potential exceeding of the levels established by law for some important primary pollutants;
- the evaluation of the effectiveness of the measures adopted for the reduction of pollutant emissions over long periods;
- the localisation of areas potentially at risk and the consequent optimum location of the automatic detection stations;
- the validation of pollutant long distance transport and deposit models for various **territorial scales**.

Given the considerable diversity of the information it is obvious that the use of biomonitoring cannot be considered as an alternative to instrumental monitoring. It provides useful information for the global evaluation of the environmental condition of an area and it is a valid tool for the preliminary identification of zones which are possibly at risk and for the territorial planning and distribution of the network of air quality monitoring stations.

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Further direct confirmation of the limits of biomonitoring studies, expressly indicated by the National Agency for the Protection of the Environment, can be found in this trial.

The IBL maps – which, in the prosecution's case, should indicate the sites of the maximum impact of the power plant emissions – do not correspond to the vanadium bioaccumulation maps. And this is already a significant piece of information because – as explained by Prof. Giugliano⁶⁵ and not disputed by the expert witnesses of the Public Prosecutor – the dust particles (which contain vanadium) behave like gases (including SO₂): it would therefore have been legitimate to expect the bioaccumulation maps and the IBL maps to correspond. But it goes further than that.

The IBL maps do not correspond to the maps which represent the simulation modelling of the SO₂ impact prepared by ARPAV in 2010⁶⁶.

These circumstances are, moreover, acknowledged by the Public Prosecutor's expert witness Dr. Scarselli⁶⁷.

It is therefore entirely obvious that – to use the words of the expert witness Prof. Giugliano – "the presumption of using a generally valid model that allows the average concentration values to be obtained in any place (or extreme values such as the 98th percentile) of one pollutant only (SO₂) from observations of lichens, could never be legitimate without giving rise to serious uncertainties", 68

(...).

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⁶⁵ See transcripts of the hearing of 16 December 2013, p. 80.

⁶⁶ See "Simulation modelling of the Enel thermoelectric power plant impact, years 2000-2006. Supporting the Rovigo DAP, proceedings no. 3946/2008".

⁶⁷ See transcripts of the hearing of 23 September 2013, pp. 32 and 33. "Public Prosecutor question – Do the areas where the lichens have been most affected coincide with the areas of maximum impact according to the modelling? – Public Prosecutor's expert witness Scarselli – They did not coincide exactly – Public Prosecutor – However, let us say that they have I should like you to explain this passage which helps to understand – Public Prosecutor's expert witness Scarselli – Yes, I shall try and explain it as well as possible. There is not what we would call a statistically significant correspondence, a correlation. It would be fair to say that'.

⁶⁸ See p. 6 of the expert witness Prof. Giugliano's technical report. According to the expert witness "it is naturally possible to formulate empirical models based on a consistent number of experimental observations which correlate the effects on the lichens to the overall concentrations of pollutants effectively measured in the atmosphere, but these types of relations, since they are not rigorously supported by a generally valid theory and since they depend on a complex series of local parameters (lichen diversity is a typically multifactorial phenomenon), can only be useful, like all empirical models, for the site from which the data that has allowed the formulation of the model has been taken.

No specific empirical model validated for the site in question has been formulated, in which the results document a one-to-one and statistically robust relationship between the extent of damage to the lichens observed and the concentration of SO_2 measured at the same time at the same point".

"Now, if the question is confirming the damage to the lichens, the issue is less important, because the damage can be evident in itself, but if it is a question of inferring the quality of the air from the damage observed, on which to then base the level of exposure for the epidemiological investigation, the database should be made up of measurements".

And even less so – if we may add – can the existence of danger to the health of the population (and consequently the existence of the extremely serious offence refuted) be inferred on the basis of the results of environmental biomonitoring! In this regard, one cannot help but refer to the constant teaching of the Supreme Court according to which "in evaluating the results of an appraisal or an expert witness's technical report it is necessary to check the scientific validity of the investigation criteria and methods used, when they are presented as new and experimental and therefore not subject to examination and critical comparison among experts in the field, so that they cannot yet be considered as part of the scientific community legacy".

As far as the allegation according to which the data provided by the Enel control units would not be reliable is concerned, to sum up very briefly: a) they would not be located in areas of maximum impact of emissions from the power plant; b) the measurements would not be correct in any event, the following can be observed.

a) Regarding the location of the Enel control units it is necessary to remember the rationale: in other words it is advisable to point out that they are located in the area in accordance with the recommendations of the Permanent Control Committee, expressly established and equipped with all the competences on the subject matter and powers to resolve on the subject matter⁷⁰.

⁶⁹ See Supreme Court, Sect. II, 11 July 2012, no. 40611, Soro; Supreme Court 834/2003; Supreme Court 2571/1997; Supreme Court 8416/1993.

⁷⁰ See annex no. 3 to the expert witness Prof. Giugliano's technical report. The situation was also confirmed by the texts of Ing. Fano, transcripts of the hearing of 2 December 2013, pp. 108 and 109, Ing. Urbani, transcripts of the hearing of 25 November 2013, pp. 84, 89 and 94.

As Prof. Giugliano has already reminded us, the work of the Committee is entirely in line with the criterion dictated by the regulations in force: health protection monitoring should operate in zones or "agglomerations (urban areas or a collection of urban areas which are not more than a few kilometres apart) where the highest levels to which the **population** is likely to be exposed are reached, directly or indirectly for a significant period in relation to the period of mediation of the limit value(s)".

In this regard, Prof. Giugliano observed: "the criterion is that of monitoring sites in which the maximum impact is expected but within the scope of urban agglomerations to be protected. In a context where resources are limited, it is clear that the positioning is the result of the compromise between the impact of pollutants and protection of the most consistent population centres, also because it is these same people who require it.

In any case, even if the ENEL power plant located in the Scardovari area, as the Public Prosecutor's expert witnesses stressed several times, was the only one in a position such as to receive the maximum impact values of the emissions from the plant, the records for the years 2001-2002 show how the figures for this station are very low and well below the air quality limits in force to protect human health. Almost all of the daily averages are between the measurement limit lower values and $10 \mu \text{g m}^{-3}$, only 4 values recorded at the beginning of 2002 are around $15 \mu \text{g m}^{-3}$, all figures which are well below both the limits valid until 2002, and those in force from 2002 onwards".

If one examines the figures for the Enel-Scardovari station – located, according to the Public Prosecutor expert witnesses, at a point of maximum impact for the emissions from the power plant⁷¹ – it is possible to see how they are entirely homogenous with the figures from the other grid stations which, according to the Public Prosecutor, would not have been located in the points of maximum impact.

⁷¹ In actual fact, it is advisable to remember that according to these same Public Prosecutor expert witnesses there are three power plants located in the maximum impact point of the

emissions from the plant: as well as Scardovari, there is also the Cà Tiepolo plant also owned by Enel and also the Porto Tolle plant run by ARPAV (see expert witnesses Pini – Rabitti January 2004 "Expert witness report under the scope of criminal proceedings no. 3577/01").

Basically, the data in the table below show that the environmental situation with reference to the SO_2 present in the places where the maximum impact from the plant would have been is very similar to that in the areas where – always according to the prosecution – the maximum impact from the plant would not have been found.

	Postazioni								
Periodo	Scardovari	Ca	Taglio	Massenzatica	Lido di	Case	Ca	Porto	
		Tiepolo	di Po		Volano	Ragazzi	Cappello	levante	
	Concentrazione media di SO ₂ nell'anno considerato (µg/mc)								
2000	3	3	3	3	2	3	4	2	
2001	2	3	3	3	2	3	3	2	
2002	2	3	4	3	2	3	3	3	
2003	2	2	2	2	1	2	2	1	
2004	1	2	2	1	1	2	2	1	

Tabella 8.2: Medie annuali delle concentrazioni di SO2 misurate nelle stazioni di monitoraggio

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b) As far as the alleged imperfect operation of the control units is concerned, Enel makes the following comments.

Firstly, it is not true – as the Public Prosecutor states – that the control units of Enel monitoring grid were, in effect, only actually checked by Enel ("self-censorship").

It has been proven that the Enel control units were monitored and validated by various public bodies.

On this point, Prof. Giugliano stated: "... although the grid was managed by Enel, operators from the Province and from ARPAV had "web pages at their disposal to check and validate the data" (see Scarselli, 2005, Expert witness report, Proceedings no. 3577/2001)".

We should also like to draw your attention on the point to what the actual Public Prosecutor expert witnesses, Pini, Rabitti, Scarselli and Totti stated: "Since the construction of the power plant (MICA decree, then Ministry of Trade and Industry, no. 183 of 25 June1973) a system of monitoring the air quality outside the plant was set up for the purpose of supervising pollution at ground level. These findings are now sent (with hourly averages) online to the Municipality of Porto Tolle, on a daily basis to the Province of Rovigo, on a monthly basis

to ARPAV, in accordance with a memorandum of understanding signed with the *Province of Rovigo* "72.

The Enel control units were therefore monitored by personnel from three different public bodies (ARPAV, the Province and the Municipality of Rovigo). In the light of this, the observations of the expert witness Prof. Giugliano are easily understandable according to which: "it is extremely unlikely that underestimates that are systematically occurring at all the stations and for several years could have escaped the attention of the (multiple) controllers too".

Moreover, the assertion of the Public Prosecutor, according to which the Enel control units were unreliable and that the public officials responsible for checking them would not have noticed this, is entirely groundless and unproven: as Prof. Giugliano has clearly pointed out "no validation campaign has been documented in which the reference monitor, using the same measurement methodology alongside the Enel sensors, has certified dissimilarity".

"In addition, the fact does not seem to have been taken into account in any way that the average annual SO_2 figures, measured using the Enel grid and the ARPAV stations, are consistent with the results of the 2010 ARPAV simulation modelling (Simulation modelling of the Enel thermoelectric power plant impact, years 2000-2006. Supporting the Rovigo DAP, proceedings no. 3946/2008) (and it is known that the most reliable data of the simulations are those which refer to the long-term averages)"⁷³.

⁷² See Expert witness report Pini, Rabitti, Scarselli, Tositti June 2008, p. 9. See also witness Ing. Fano, transcripts of the hearing of 2 December 2013, p. 110.

⁷³ In his summing-up, the Public Prosecutor made a fleeting reference, as demonstration of the charge, to the fact that brief measurement campaigns conducted by ARPA Emilia Romagna in the municipality of Mesola showed higher values than the measurements taken by the Enel grid. The Public Prosecutor forgot, however, to say how the same Public Prosecutor expert witness Scarselli had shown, with reference to the result of the measurement campaign conducted in Mesola, the following: "... albeit apparently marked, such differences are not considered significant, because the concentrations of \hat{SO}_2 measured are very low, always below the levels of attention and close to the minimum threshold values..." (see expert witness Scarselli, 9 October 2005, Expert witness report, Proceedings no. 3577/2001). In this regard, Prof. Giugliano observed: "in reality the systematic differences observed, believed by the said Public Prosecutor expert witness initially not to be significant but then used tout court as proof of underestimation, pertain to the classic problems of instrument sensitivity. The sensitivity of an instrument is made up of the smallest magnitude capable of generating a significant signal at the start of the measurement range and which thereby defines the lower limit of the actual range (the upper limit is represented by the end of scale). Two instruments, despite both being valid, can measure systematically different values, but if these values are close to the sensitivity limit, the differences have no meaning and it is wrong to extend the measurement difference observed in the end of scale zone to the rest of the measurement range. Thus, the conclusions of ARPA Emilia Romagna, the only

It must then be noted how Prof. Giugliano⁷⁴ demonstrated (and documented) that the data provided by the Enel Scardovari control unit – according to the same Public Prosecutor expert witnesses located in the area of maximum impact from the emissions of the power plant – were in an order of magnitude **entirely comparable with those of the** Porto Tolle **ARPAV power plant,** also situated – as stated by the Public Prosecutor expert witnesses⁷⁵ – in the area of maximum impact.

In actual fact there are further evidentiary elements that unequivocally demonstrate that the allegation of the Public Prosecutor about the poor reliability of the Enel control units is without any foundation.

Reference is made to the previously mentioned "Porto Tolle Enel thermoelectric power plant encroachment simulation modelling for the years 2000-2006 – Simulation modelling supporting DAP Rovigo and required under the scope of proceedings no. 3946/08 General Criminal Records Registry".

Specifically, see, for example, figure 9 on p. 8 of the ARPAV study.

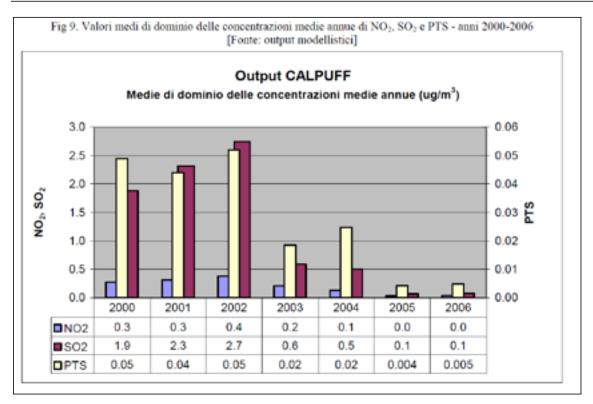
one responsible for evaluating the results of the brief measuring campaigns conducted in Mesola, which would have provided proof of the underestimation of the figures by the Enel grid, are as follows:

P. 38 '....... the SO₂ values in the air in Mesola are well below the legal limit and close to the

quantification limits of the detection method used...' and in another part of the report '... It is possible that the difference in the measurements between the ARPA campaigns and the Enel fixed measurements can be explained by the different location of the analysers (mobile equipment positioned in an urban area and Enel stations in the open countryside) as well as in the fact that different measuring systems were involved...' (ARPA Ferrara, "Technical report on the investigations into the air quality carried out in Mesola in the years 2002 – 2003; Supplementary expert witness report, December 2008, p. 38, Proceedings no. 4163/07) (Pini, Rabitti and Scarselli, 2008, Supplementary expert witness report. Evaluations of the Enel responses to the observations of the Veneto Region. Proceedings no. 4163/07)" (see expert witness Prof. Giugliano's technical report pp. 15 et.seq.)

⁷⁴ See p. 16 expert witness Prof. Giugliano's technical report.

⁷⁵ See Pini-Rabitti Expert witness report in the criminal proceedings no. 3577/01 of January 2004, p. 58.



It is actually easy to note that the data relating to the SO₂ are absolutely comparable with the data detected by the Enel control units given below.

	Postazioni								
Periodo	Scardovari	Ca	Taglio	Massenzatica	Lido di	Case	Ca	Porto	
		Tiepolo	di Po		Volano	Ragazzi	Cappello	levante	
	Concentrazione media di SO ₂ nell'anno considerato (µg/mc)								
2000	3	3	3	3	2	3	4	2	
2001	2	3	3	3	2	3	3	2	
2002	2	3	4	3	2	3	3	3	
2003	2	2	2	2	1	2	2	1	
2004	1	2	2	1	1	2	2	1	

Tabella 8.2: Medie annuali delle concentrazioni di SO2 misurate nelle stazioni di monitoraggio

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In actual fact, it is impossible not to note how - as far as the alleged poor operation of the Enel control units is concerned - the Public Prosecutor transformed what his expert witness expressed in essentially doubtful terms into a certainty.

On p. 3 of the expert witness report of Dr. Scarselli "Epidemiological analysis for the evaluation of the possible health effects in relation to the

air quality in the zone of the Polesine Camerini (Po Delta) Enel plant" it is stated as follows: "the reliability of the data of some parameters measured by the Enel grid is fairly doubtful".

Moreover, the expert witness Dr. Scarselli never conducted a specific check on the single control units in order to verify his theory, so much so that, with reference to the potential "issue of underestimation of SO₂ and dust particle (PTS) concentrations", he is compelled to formulate another theory in which he states that the problem would "probably be due to calibrations defects and/or the obsolescence of the sensors installed in the control units"; this theory too, as seen above, is disproved by documentary and witness evidence.

In the light of the above, the following conclusions should be drawn:

- a) the Enel control units were, everything considered, well positioned and, at any rate, located in agreement with the public authorities;
- b) the data provided by the Enel control units are deemed to be entirely reliable.

These data, together with those coming from the ARPAV control units, as well as the results of the simulation modelling of the same Regional Agency, do not show any environmental criticalities with regard to air quality in the years under examination.

In conclusion, it is impossible to even surmise that the health of the population and the well-being of the environment would have been put in jeopardy.

It has been seen how, according to the law of the Supreme Court, the danger (the element constituting the offence pursuant to Art. 434 c.p.) should be concrete and effective and as such should be proven beyond reasonable doubt. In this case, all the objective and definite elements of proof demonstrate the opposite of the prosecution's case.

The data on the air quality at the time of the conduct imputed to Mr. Scaroni (in other words, those supplied by the Enel power plants and ARPAV) prove the presence of pollution well below that required for safeguarding the ecosystems and human health.

And the result does not change if one considers the evidence of the modelling investigations

carried out, at the specific request of the Public Prosecutor's Office of Rovigo, precisely to evaluate the quality of the air in the period concerned. In conclusion, the offence pertaining to Art. 434, para. 1 c.p. must be deemed to be non-existent.

b) The non-existence of the harmful event pertaining to para. two of Art. 434 c.p.

It was already pointed out in the preamble how the disputed disaster, consisting of an alleged increase in hospital admissions of children in the period from 1998 to 2002, cannot be imputed to Mr. Scaroni.

It is therefore only for the sake of defence that we are examining – albeit in brief taking the above into consideration – the issue relating to the event.

Firstly, it should be remembered how the absence of any possible correlation on an epidemiological level between the emissions of the power plant and the health of the population and, specifically, children, is acknowledged by said "Epidemiological study into respiratory conditions in children and the environment of the Provinces of Ferrara and Rovigo", mentioned several times by the Public Prosecutor.

This investigation expressly acknowledges that "in the North-East area – where according to the same authors of the research the impact of the power plant⁷⁶ is found – "there are no statistically significant correlations between pollutants and symptoms."

In addition, this epidemiological study drew the following conclusions "no relation can be established between the results and the source of pollution present in the area"⁷⁸.

⁷⁶ See pp. 18 and 22 of the "Epidemiological study into respiratory conditions in children and the environment in the Provinces of Ferrara and Rovigo".

⁷⁷See p. 34 of the "Epidemiological study into respiratory conditions in children and the environment in the Provinces of Ferrara and Rovigo".

⁷⁸See p. 45 of the "Epidemiological study into respiratory conditions in children and the environment in the Provinces of Ferrara and Rovigo". Leaving aside what has been shown even where the authors of the study have identified a modest association between pollutant concentrations and respiratory symptoms, the risk identified is statistically negligible as the expert witnesses for the defence stressed: "the OR found between respiratory symptoms and atmospheric pollution are all equal to or very close to 1, indicating the absence or inconsistency of the association between

That having been stated, it is obvious that the indictment in question is based exclusively on the epidemiological expert witness report of Dr. Crosignani.

With regard to the evidentiary value of this expert witness report, the expert witnesses for the defence and the undersigned attorneys can only refer to their arguments and the related conclusions⁷⁹.

That having been said, a few reflections can be made.

First of all, it is necessary to recall how on the subject of the evaluation of the expert witness evidence – and even more so this must be valid for a partyappointed expert – where the expert witness opinion (or report) is based on "knowledge belonging to the public domain" of the experts and on "established" investigation techniques", the Court is obliged to verify "the correct application of said knowledge and techniques",80.

Coming to the case in question, it is completely obvious that the conclusions of the expert witness Dr. Crosignani betray the principles unanimously recognised in epidemiology and in truth also accepted by the expert witness of the Public Prosecutor. Specifically:

1) It is the common knowledge in epidemiology that an "estimated related risk" in case-control study, defined as an odd ratio (OR) 81, must have statistical significance.

As the Public Prosecutor expert witness Dr. Crosignani recognises, "in order to define the statistical significance of an OR it is necessary to refer to the confidence interval

symptoms and pollutants (PM10 and NO₂) in all three areas under consideration" (p. 25 Expert witness report Foà – La Vecchia – Maestrelli – Valenti).

⁷⁹ Prof. Carlo La Vecchia, Professor of Epidemiology and Medical Statistics at the State University of Milan, Head of the Department of Epidemiology of the Mario Negri Institute, Full Professor of Epidemiology, Institute of Social and Preventive Medicine, University of Lausanne, Switzerland (since 2002) and Adjunct Professor of Medicine, School of Medicine, Vanderbilt University, Nashville, TN (2002-2005); Prof. Marco Valenti, Professor of Epidemiology of the University of L'Aquila; Prof. Vito Foà, formerly Professor of Occupational Medicine of the University of Bari, Scientific Director of the bi-monthly Italian Journal of Occupational Health and Industrial Hygiene, Prof. Piero Maestrelli, Professor of Occupational Medicine of the University of Padua.

⁸⁰ See Supreme Court, Sect. V, 9 July 1993, Ietto.

⁸¹ In essence, the OR "indicates how many times the probability of falling ill with a pathological condition increases or decreases in a person exposed to a given factor compared with someone who is not exposed" (see Expert witness technical report Foà - La Vecchia - Maestrelli - Valenti, p. 9). Also see "Epidemiological analysis for the evaluation of the possible health effects in relation to the air quality in the area of the Porto Tolle power plant" Crosignani and others.

(95% CI) "82.

This involves a cardinal **statistical concept** in epidemiology, "which tells us whether the estimate of the OR taken from the case-control study is the random product of statistical fluctuations or, on the other hand, demonstrates the existence of an effective association between exposures and results".

As a result, an OR without statistical significance should be evaluated as non-risk.

In addition, in case-control studies, according to said Public Prosecutor's expert witness, a further indicator should be considered: "the one defined as '**p** for the trend', which tells us whether, as the level of exposure increases, there is a proportional increase in the risk"⁸⁴.

The importance of this indicator is obvious: if, as exposure increases, the risk being investigated does not increase, it is clear that the estimate of this risk loses epidemiological significance.

Now, the expert witness of the Public Prosecutor has not taken these principles into account where he surmised the existence of an attributable risk (AR) for the hospitalisation of children in relation to the indicator of lichen biodiversity and to the vanadium indicator.

In actual fact Dr. Crosignani in the first case, while recognising the absence of "statistical significance" and of "trends" claimed the existence of a "minimum presence of risk" and even in the second case, while admitting the lack of "trends", stated that there was a "minimum presence of risk".

During the hearing the expert witness of the Public Prosecutor tried to justify the inconsistency of the conclusions in relation to the premises of the reasoning, sustaining that the statistical "significance" as much as the "trend" would be "statistical artifices" and also that the "lack of statistical power" of the results obtained "lies in the fact that we are studying a.... small population".

This statement is astounding: on the one hand epidemiology is a

⁸² See p. 18 "Epidemiological analysis for the evaluation of the possible health effects in relation to air quality in the area of the Porto Tolle power plant" Crosignani and others.

⁸³ See p. 10 Expert witness technical report Foà – La Vecchia – Maestrelli – Valenti).

⁸⁴ See p. 18 "Epidemiological analysis for the evaluation of the possible health effects in relation to air quality in the area of the Porto Tolle power plant" Crosignani and others. Under the same terms, see p. 11 Expert witness report Foà – La Vecchia – Maestrelli – Valenti.

⁸⁵ See transcripts of the hearing of 21 October 2013, pp. 41 and 42.

science based on statistics and therefore the rigour in complying with these principles – as in any scientific activity – should be absolute. On the other hand, the expert witness blatantly contradicts the methodological premises (shared by the entire scientific community) that formed the cornerstone of his investigation. And this is to mute the fact that a study on a restricted number of subjects – as is the one in question – is in and of itself fragile from an epidemiological standpoint.

2) The inconsistency of Dr. Crosignani's study also emerges from another profile. The Scarselli – Crosignani– Magnani Expert Witness Technical Report affirms, "the tercile method" is "considered preferable from a statistical point of view for its division into study groups of this type"⁸⁶.

It is well known that the division of a group into "terciles" means dividing it into three equal sub-groups.

Nevertheless, as the defence expert witnesses have clearly shown "in the Crosignani study the division into three exposure groups was done on the basis of a criterion not founded on the actual distribution within the population (which would produce uniform terciles, i.e., three groups each containing 33.3% of the subjects). The Public Prosecutor expert witness, instead, divided the population into groups, identified by the levels of the impact of pollutants in the local areas where they live (this way, the E0 group is the one that lives in the area with the lowest level of certain pollutants, the E1 group has an intermediate level, with the E2 group having the highest level). This ends up producing exposure groups that are not uniform in number: in fact, instead of using a unique criterion for the determination of the thresholds of each pollutant, the authors adopted a relative threshold basis, which could maximise the possible statistical effects for areas with the greatest impact".

The division of the population surveyed into non-uniform groups constitutes an improper criterion at the epidemiological level⁸⁸.

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⁸⁶ See p. 9 of the Scarselli – Crosignani – Magnani Expert Witness Technical Report.

⁸⁷ See pp. 38 and 39 of the Foà – La Vecchia – Maestrelli – Valenti Expert Witness Technical Report.

3) Lastly, it should be considered that, notwithstanding the many environmental pollutant indicators examined (NO₂, SO₂, IBL and bioaccumulation of vanadium), in Dr. Crosignani's study, multiple tests were performed.

Now therefore, "when a series of statistical tests are performed on the same sample of subjects – as occurred in the Crosignani study – the probability that at least one of the tests has significant results increases considerably (one test out of 20 performed, that is 5% will in any event turn out to be significant in the absence of correlation): this is an elementary statistical concept well-known to every epidemiologist. Now, the Crosignani study performed exactly 20 risk measurement tests on the child population: there was therefore a non-negligible a priori probability (i.e. 5%), that at least one test would turn out to be statistically significant, which is precisely what occurred"89.

This, even if the circumstance pointed out above were to be set aside, i.e. that in reality no test had results that were epidemiologically significant.

4) Finally, as an additional proof of the lack of reliability of Dr. Crosignani's study, the difference in the attributable risk (AR) found between male and female children with reference to vanadium accumulated in lichens is impossible to ignore. The expert witness for the defence did indeed point out, "the difference in the OR confidence intervals between the two genders has no biological plausibility whatsoever" 90.

Ultimately, one must agree with the party-appointed expert witnesses who found that Dr. Crosignani's epidemiological investigation should be ranked on a scientific level between "the so-called negative studies, i.e., studies that lead to the rejection of the initially formulated hypothesis, or rather the association between exposure to a series of environmental pollutants and the onset of respiratory illnesses" ⁹¹.

For the sake of comprehensiveness, the issues linked to the mortality studies from the Veneto Tumour Registry, cited by the plaintiffs will be examined briefly.

In fact, these studies were not used to sustain the event causing the disaster crime but were indicators of a general health hazard connected to the power plant's emissions.

 ⁸⁹ See p. 50 of the Foà – La Vecchia – Maestrelli – Valenti Expert Witness Technical Report.
 90 See p. 43 of the Foà – La Vecchia – Maestrelli – Valenti Expert Witness Technical Report.
 91 See p. 57 of the Foà – La Vecchia – Maestrelli – Valenti Expert Witness Technical Report.

Since however the issue has been discussed by medical consultants, it is appropriate to deal with it herein.

That said, it should be immediately clarified that the data that can be drawn from the lung tumour mortality studies referred to by the Ministry of Health plaintiff, undertaken by the Local Health Authority (ASL) n. 18 and n. 19 over the years have no findings that could be in any manner whatsoever associated with the operation of the Porto Tolle Power Plant.

As has been clarified by the medical consultants for the defence, it should be pointed out that lung tumours have a latency period of between twenty and thirty years⁹².

Therefore, the data referred to the period between 2001 and 2007 (and *a fortiori* the data from 1980 to 1999) may be linked to causes from factors dating back to a period that is even previous to the start of operations of the Porto Tolle Power Plant and certainly cannot be referred to the years being discussed in these proceedings.

From the studies referenced by the plaintiffs, there is clearly a significant difference in the male and female mortality rates.

In the study conducted by the Veneto Region – Veneto, Oncology Institute "Analysis of the incidence of tumours in the ASL 19 Adria district for 2004" it is pointed out how "the excess risk for areas such as the lungs, larynx and bladder, restricted to males alone leads to the hypothesis that occupational and/or voluptuary were intervening factors…".

In the Veneto Tumour Registry monograph "Geographic and temporal mortality analysis for the Province of Rovigo in the period 1980-1999" one may read, "such a different, actually contrasting, situation between the two sexes, indicates that certainly there is a carcinogenic exposure for males, which may be linked, for example to occupational activities or smoking habits". No mention is made by these authors, as is logical, of any environmental types of exposure, which obviously would bring about a risk for females that would be equal to that of males.

Maintaining, as has been heard from the plaintiffs, that women are stricken by fewer lung illnesses because they "stay at home" is a comment that speaks for itself!

⁹² See hearing transcripts on 17 January 2014, pp. 163 and 164. As further proof, see e.g. the studies from the Center for Disease Control and Prevention (data drawn and analysed from the entire 20th century).

Apart from the above, the witness deposition of Dr. Poletti, physician and surgeon working with the Adria ASL 19 district should be recalled. He affirmed – also in the light of his knowledge of the "USL (Local Health Authority) statistics from the entire North-East of Italy" - that he, over the course of his extensive professional experience, has recognised a *trend* in respiratory illnesses that is similar in the entire Veneto Region and the North-East of Italy.

The witness pointed out, among other things, how among the sources of pollutants in the area in the vicinity of the power plant there is the Po River ("We have a river, which I believe is one of the most polluted in Italy") but "even the same agriculture," which "has used many contaminating substances and many pesticides, which are certainly carcinogenic, so, actually, there are many factors that may have caused this increase in illnesses",94.

The clarifications offered on this point by the defence witness experts as well as witness Poletti's statements are clearly confirmed in the "Final report of the Technical Group on the emissions produced by the Polesine Camerini Power Plant and the possible effects on the health of the population",95.

Among those in that technical work group, there were also the Director of the Regional Environmental Epidemiology Issues Centre, the Director of ARPAV Technical-Scientific Area and the Scientific Director of the Veneto Tumour Registry.

It should be noted that the technical work group was instituted – as may be drawn from that same report – "subsequent to an information note from the Rovigo Public Prosecutor's Office of 23 July 2007, concerning the health effects of the combustion processes originating from fossil fuels, within the scope of the Criminal Proceedings no. 1338/2005 R.G.N.R., [General Criminal Records Registry] on the environmental pollution produced by Enel's Polesine Camerini Power Plant".

The conclusion of those experts was as follows: "In the descriptive analyses referred to above, there are no particular mortality profiles referring to the specific geographic area in which the plant in question is involved (Municipality of Porto Tolle and the surrounding areas) that may be associated with the presence of a localized source of pollution"!

⁹³ See p. 73 transcripts of hearing on 18 November 2013.

See pp. 67 and 69 transcripts of hearing on 18 November 2013.
 See Annex 5 Prof. Giugliano's Expert Witness Technical Report.

Even the Public Prosecutor expert witnesses Bai and Rabitti expressed a similar opinion: "The data available on pollution in the area and on the relevant contribution by the power plant are not demonstrative of an evident effect on human health. The notable increase in the mortality rate due to lung tumours, highlighted in several statistical surveys in the area, is a part of a more general phenomenon involving a vast area including the Province of Ferrara as well. The explanation of this phenomenon is as yet unknown to us, but it does not appear to be correlated to power plant emissions."

In conclusion, the argument on this point by the plaintiff supporting some type of causal link between the power plant emissions and lung tumours lacks any scientific ground.

c) The subjective element of the offence as set out in Art. 434, paras. one and two, c.p.

As concerns the subjective element concerning the alleged aggravation of the offence described in the second paragraph of Art. 434 c.p., the case law of the Supreme Court is consistent in maintaining that **wilful intent**⁹⁷ is required. This applies when the party acts with the intent to cause the criminal event or to perform the criminal offence.

In other words, the performance of the intended act constitutes the reason behind the actual conduct.

The definition of wilful intent, for that matter, has been set out by the Supreme Court United Sections, ⁹⁸ which established the principle according to which wilful intent applies "in a situation in which the event is pursued as a final objective".

⁹⁶ See Bai-Rabitti "Technical Report - Proceedings no. 3577/01 - 2004", p. 22.

⁹⁷ See from the most recent Supreme Court, Sect. I, 14 December 2010, no. 1332, Zonta; Supreme Court, Sect. IV,

⁵ May 2011, no. 36626, Supreme Court, Sect. I, 7 October 2009, no. 41306, Scola. Supreme Court, United Sections, 25 January 1994, no. 748.

With specific reference to the disaster event as set out in the second para. of Art. 434 c.p., the Supreme Court reaffirmed that the wilful intent provided for by this case requires the will of the agent "precisely aimed at the production of the event that constitutes the offence against the asset protected by the law"⁹⁹.

In the case under review, for the existence of the subjective element required by Art. 434, para. 2, c.p., it should be demonstrated that the active and omissive conduct with which Mr. Scaroni has been charged had "as its final objective" the challenged disaster event, i.e., the increase of hospital admissions of children for respiratory illnesses.

As concerns the situation provided for by the first para. of Art. 434, there are two opposed approaches in the case law.

The first – cited by the Public Prosecutor – if on the one hand, it reiterates that, "the wilful intent (dolo intenzionale) is intentional with respect to the disaster event", on the other, it affirms that "the intent is reckless (dolo eventuale) with respect to the hazard to public safety" ¹⁰⁰.

According to another approach in case law – stricter and more in defence of civil rights and as we see it the most correct even on the level of the more literal interpretation and the spirit of the law – instead "the psychological element required for classification pursuant to Art. 434 as being constituted by reckless intent is to be excluded", because, instead, wilful intent is required ¹⁰¹.

Stated in the grounds given for the judgment cited above, "According to the by now consolidated doctrinal interpretation, there is direct or wilful malicious intent when the will of the agent is aimed at a specific result. The results of that conduct that were in any event foreseen by the subject, even though only possible, are considered just as desired, as long as the subject accepted the risk, or more simply, as long as the subject did not act with the certain conviction that the results would not be obtained. In this case, the intent is qualified as indirect or reckless intent. Within the scope of the psychological element of the offence, however, this latter category of criminal intent is not applicable to any type of criminal conduct.

⁹⁹ Supreme Court, Sect. I, 14 December 2010, no. 1332, Zonta.

¹⁰⁰ See Supreme Court, Sect. I, 14 December 2010, no. 1332, Zonta.

See Supreme Court, Sect. I, 7 October 2009, no. 41306, Scola. The prevailing doctrine is set out in the same terms. See Corbetta in Marinucci–Dolcini, Treatise on Criminal Law, Special Part, II, 1, 639; Gizzi in Codoppi –

Canestrari - Manna - Papa, Treatise on Criminal Law, Special Part, IV, 242.

When, indeed, it occurs that the criminal law provision explicitly requires that the subject acted with a specific objective, it is not possible to hypothesise that the subject acted at the expense of determining that end, from which it evidently follows that in such a case, there is a logical incongruity between the premise and the datum to which it is connected. This is what is found in the hypothesis in question. Arriving in fact at the criminal law provision as set out in Art. 434 c.p., the relevant codes require, for the existence of the crime, that the agent commit 'an act aimed at causing the collapse of a building or of a part of the building or other disaster', so that, in the event whereby the act was performed not with the intent of pursuing this result, i.e., to cause a disastrous collapse or other disaster, but in the pursuit of another objective, then both the objective element of the crime, which, in order to be constituted requires, precisely, 'an act aimed at causing' collapses or disasters, and the psychological element of the crime, from which it follows that the malicious intent outlined above in the hypothesis of the criminal situation in question, would require the direct will to cause said collapse or other disaster, cease to exist. In other words, it is possible to hypothesise the theoretical type of reckless intent only if the law does not explicitly require that the subject agent set out to perform that conduct with a specific objective."

"In conclusion, the following principles of law may be affirmed: a) reckless intent is incompatible with the criminal assumptions in which the psychological element of the offence is typed in terms of direct will to achieve a specific objective, appropriately described by the criminal law provision; b) the psychological element required by Art. 434 c.p. for the existence of the offence, having been described in the hypothesis typed by the law-maker as will aimed at causing collapse or another disastrous event, rules out the possibility of a concrete accusation of a crime considered as reckless intent".

Now therefore, note the following:

In the documents, there is not even one element of evidence, not even circumstantial, that might be construed as an offence of wilful intent, with which Mr. Scaroni is charged, as provided for by the law in question.

The same Court of Adria excluded that Mr. Scaroni's conduct might be considered as constituting wilful intent.

By the way, it should be recalled that Mr. Scaroni was held responsible exclusively for the fine concerning the so-called deterioration of the emissions only for the year 2004, determined by the recourse to a mix of fuels with a sulphur content that was slightly higher than that found in the fuel used the year before.

As has already been recalled, the defence had shown that this offence had not been committed. On this point, a final judgment may not be considered to have been handed down on the basis of the arguments set out above.

Hence, it is urgent that here it be pointed out that in the judgment of 31 March 2006, the Judge had analysed the subjective element regarding with which Mr. Scaroni was charged, deeming it, "limited to fault and not to reckless intent" 102.

Actually – as concerns the events subject of these proceedings – Mr. Scaroni's conduct does not even appear to bear any fault.

Indeed.

From reading the heads of indictment the events aimed at causing the disaster from which the hazard to public safety was to have arisen (and for the period from 1998 to 2002 also a disaster) were supposedly comprised of:

- 1) his having "omitted requesting and having requested the reconversion of the plant" (the Porto Tolle Power Plant) "in the manner and times provided for by the Veneto Regional Law no. 36/97 as amended";
- 2) his not having provided for plants or instruments "for the containment of the sulphur and nitrogen oxides, dust and other pollutants";
- 3) his having continued to "run and permitted to run the Porto Tolle Thermo-Electric Power Plant with heavy fuel oil with a sulphur content (percentage of sulphur in the fuel oil used ranging from 3% to 1% and in any event greater than 0.25%)": basically not having used the so-called sulphur-free fuel oil also in the groups 1, 2 and 3^{103} .

 $^{^{102}}$ See p. 264 of the judgment of 31 March 2006. 103 There was no discussion of the fact that in group 4, beginning in 2000, only sulphur-free fuel oil was used.

Now therefore, the following is noted:

1) When Mr. Scaroni was appointed the Enel CEO, an environmental upgrade project had been submitted.

In particular on 3 August 2000, Enel submitted, to the Ministry of the Environment and to the Veneto Region, Department of Ecology and Environmental Protection, the environmental upgrade project for the Porto Tolle Power Plant pursuant to Presidential Decree 203/88¹⁰⁴.

Therefore, it is evident that Mr. Scaroni cannot be held responsible for the presumed delays in requesting the reconversion of the Porto Tolle Power Plant in the manner and times provided for by the Veneto Regional Law no. 36/97 as amended by Regional Law no. 7/99. To be precise, the reconversion project was submitted on 3 August 2000, therefore, within the 18 months provided for by Art. 25, para. 2, of Regional Law no. 7/99.

The August 2000 upgrade project (the so-called Orimulsion reconversion), among other things, was found to be consistent with the requirements of the Regional Law, which – in contrast to what the Public Prosecutor assumed – did not foresee as a unique possibility the use of natural gas as a fuel, but rather, also permitted "other alternative sources with equal or lesser environmental impact...".

During this trial, the Public Prosecutor has several times referred to the VIA Commission's interim opinion, critical of the Orimulsion project, dating back to 20 December 2000.

It is blatantly clear that the so-called Orimulsion project, just as all of the reconversion plans were, would be developed and changed under the normal and legitimate discussions among the parties involved.

Already prior to May 2002 – a time when Mr. Scaroni joined Enel – the reconversion plan had undergone several changes as will be shown below.

What, in reality, is relevant, for the purposes of the evaluation of Mr. Scaroni's personal position, is that many public authorities, well after the initial critical comments contained in the Ministry of the Environment's VIA Commission opinion dated 20 December 2000, concluded on the environmental compatibility of the Orimulsion reconversion project also using specific reference to the requirements of the Park Regional Law.

¹⁰⁴ See Annex 8 Prof. Pasquon's expert witness technical report.

Firstly, the same Province of Rovigo in the "Technical opinion on the environmental project submitted by Enel for the Porto Tolle Thermo-Electric Power Plant" dated 27 February 2002 affirmed, "... considering the technological impossibility of the combined cycle conversion using natural gas as fuel, it has been deemed that the project submitted contributes towards a considerable improvement in air quality over the area where the Enel Polesine Camerini Power Plant is located in the Municipality of Porto Tolle; therefore, even though including the suggestions indicated, it is worthy of approval by the competent agencies" 105.

Decisive then was the decision expressed by the Veneto Regional Environmental Impact Commission (26 May 2003) and by the same Veneto Region (13 June 2003), which issued the Law being discussed, by way of which the project submitted by Enel Production for the Power Plant reconversion would have made it possible to comply with the provisions laid down by Art. 30 of Regional Law 7/99 in the part where it says, "equal or lesser environmental impact," considering the impact on both the local area and on air quality.

Below are some of the more significant passages in the Veneto Regional Environmental Impact Commission opinion.

"The principal issue for the Porto Tolle Thermo-Electric Power Plant Environmental update project proposed by Enel consists of the demonstration of its compatibility with Regional Law no. 36 of 8 September 1997" (...).

"Art. 30 of this law provides that, 'power plants shall be fuelled by natural gas or by other alternative sources with equal or lesser environmental impact' (...).

If the Porto Tolle Power Plant with its characteristics of the dimensions of its sections and of its technology, were to use natural gas as fuel, it would have extremely modest yields and could therefore not stay in business.

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¹⁰⁵ See Annex 36 Prof. Pasquon's Expert Witness Technical Report, p. 11.

To use natural gas would necessarily require the construction of a new power plant with 7 combined cycles with the plant currently in existence being torn down. The construction of a new oil pipeline [gas pipeline ndr] for natural gas transport (...).

Nevertheless, an exhaustive assessment of a natural gas conversion compared to that for Orimulsion should be seen beyond its impact on air quality but also on its impact on the local area.

This latter aspect has two components:

- the need to build a new 380 MW power plant with 7 combined cycle turbines and tearing down the existing plant;
- the need to build a new gas pipeline. Based on data from a study conducted by SNAM, it is clear that such a gas pipeline would have to be 55 km long connecting Trevigalle (actually Tresigallo ndr) to Porto Tolle, requiring the crossing of the Mesola forest and five river crossings. The impact on the local territory caused by the river crossings would be significant, at least during construction. It would require the creation of a sort of 55 km long and 100 m wide motorway involving many SIC [EU protected lands] and ZPS [Specially protected lands] areas. Moreover, to fuel a natural gas power plant with 7 combined cycles would require a suitable gas pipeline with a capacity that could only be ensured through the Tresigalle gas pipeline.

Consequentially no other gas pipeline could be used 106...

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¹⁰⁶ The Veneto Region VIA Commission's assessment of the gas pipeline clearly takes into account the fact that, as clearly pointed out by the expert witness prof. Pasquon, during the years in question "there was no certainty of the construction of the Porto Viro gas pipeline, which for that matter came into operation in August 2009". Indeed, it is absolutely obvious that basing the reconversion plan of a power plant the size of the one in Porto Tolle by relying on an LNG regasifier that was not yet built or in operation would defy all logic. In addition – as clearly pointed out by Prof. Pasquon - "It was not possible or even less expected that ENEL could obtain gas supplies pertaining to the afore-mentioned regasifier in that the production of LNG regasifiers is usually booked beforehand by the companies that build them, well before they are completed. In this specific case, this was a multi-company project (including Edison) by ENEL competitors. It should be noted that 80% of the regasifier capacity was assigned by contract to Edison; the remaining 20% (1.6 billion m³/year) would have been insufficient to cover the Porto Tolle Thermo-Electric Power Plant's requirements (2 billion m³/year). In any case, connection to the Porto Viro regasifier would require that the power plant be technically and economically dependent on a single supplier, with problems connected to both the plant's profitability and supply continuity. This is also accounting for possible periods of terminal down time due to poor weather and sea conditions, blocking the mooring of supply ships. This would cause serious safety hazards as well as compromising the protection of ENEL's independence on the market".

The V.I.A. Commission basically assessed two different parameters:

"a) impact on the local territory: the 7 turbine combined cycle natural gas power plant would require a new 55 km long gas pipeline and the tearing down of the existing power plant, because the existing turbines due to issues of physical space could not be used. The Orimulsion plant had lesser impact on the local area because it would use the existing gas pipeline (actually the oil pipeline, ndr) and the existing plant.

b) Impact on the air quality: as concerns the NOx, the natural gas plant would produce 50 mg/Nmc of NOx with 15% of O2. Impact on the ground is 5 times greater than those from Orimulsion since the power plant would have to have 7 90-metre high chimneys and therefore lower than those used for Orimulsion fuel.

The Orimulsion plant would produce 100 mg/Nmc with 3% of O2 at the chimney stack and would have a 240-metre high chimney stack.

Comparing the NOx levels between natural gas and Orimulsion fuels, the Orimulsion has less impact on the ground than the natural gas and therefore has less impact as concerns this parameter.

As concerns SO_2 , the natural gas plant does not have emissions and so has no SO_2 impact. (...)

OVERALL ASSESSMENT

In an overall assessment one can maintain that in this specific case the impact of natural gas fuel on the local area is less than that coming from using Orimulsion, given the possibility, in this latter case, of using pre-existing infrastructure (...). The impact on air quality sees the use of Orimulsion combustion at an advantage as concerns NOx and at a disadvantage for the SO_2 and particulate, even if the particulate level is nearly zero. (...) Analysis of the impacts was also assessed on the basis of two matrices (one with assessment

during operation and the other during construction) through which the impact factors are compared for natural gas and Orimulsion fuelling.

From the data, it is clear that the impact of Orimulsion fuelling is not greater than that of natural gas.

Therefore, it may be said that Orimulsion fuelling with emission levels at the chimney stack of 200 mg/m3 of SO₂, as provided for by the Enel-Region agreement, enables compliance with the provisions laid down by Art. 30 of Regional Law 7/99 in the part that says 'equal or lesser environmental impact', considering both the impact on the local area and on air quality".

It should also be noted that the Veneto Region decision, which acknowledged and then made Regional V.I.A. Commission's opinion its own, was taken upon the completion of a complex procedure undertaken in joint discussion among all involved parties, in particular after having heard not only Enel Produzione's point of view, but also the opinion of the Po Delta Park, involved in the project assessment submitted by the same¹⁰⁸.

From the documents filed, it emerges that the other local territorial agencies were fully involved as well as citizens and association committees including those that more decisively opposed the Enel Produzione project¹⁰⁹.

The reconversion project to Orimulsion also received a positive opinion from the Ministry for Cultural Heritage and Activities (by note dated 17/12/2004), and from the Environmental Impact Commission of the Ministry of the Environment and Territorial Protection (Opinion no. 621 18 September 2004) as results from the letter dated 13 December 2005 from the Director General of the Ministry of the Environment and the Territory¹¹⁰.

¹⁰⁷ See Annex 57 Prof. Pasquon's Expert Witness Technical Report.

¹⁰⁸ See e.g. letter Enel Produzione 17 September 2001, Annex 22 to Prof. Pasquon's Expert Witness Technical Report; See also letter Enel Produzione 11 February 2002, Annex 32 to Prof. Pasquon's Expert Witness Technical Report.

Report.

109 See page 1 of Opinion no. 52 of the Regional V.I.A. Commission of 26 May 2003, Annex 57 to Prof. Pasquon's Expert Witness Technical Report.

See Annex 71 Prof. Pasquon's Expert Witness Technical Report. See also the witness Mr. Urbani, transcripts of hearing on 25 November, pp. 29 and 30. Recall that, as emerged from the testimony of numerous witnesses, the reconversion project to Orimulsion had to be abandoned because of the controversy that arose with Venezuela – the world's only producer of Orimulsion – which had stopped supplying this fuel. On this point see Witness Mr. Urbani, transcript of hearing on 25 November 2013, p. 31; Witness Mr. Camponeschi, transcript of hearing on 9 December 2013, pp. 17 and 18; Witness Mr. Vagliasindi, transcript of hearing on 2 December 2013, pp. 68 and 69; Witness Mr. Fano, transcript of hearing on 2 December 2013, pp. 94 *et seq*.

In light of the above, there is no reason why Mr. Scaroni should be accused of having circumvented the Regional Law on the Park!

2) The challenge concerning the failure to provide for plants aimed at containing the emissions concerns desulfurization plants (DeSOx) and denitrification plants (DeNOx)¹¹¹.

Therefore, it should be pointed out that when Mr. Scaroni was appointed as CEO, Enel had already explicitly requested the permission of the competent agencies to install desulfurization and denitrification plants.

In particular, from the documents annexed to Prof. Pasquon's Expert Witness Technical Report and from the testimony of Mr. Urbani the following emerges.

- On 3 August 2000 Enel Produzione, within the scope of the "Environmental update project with the installation of flue gas desulfurization plants of July 2000", requested the permission of the competent agencies to install a system for the desulfurization of the flue gases without having to go through the long and complex procedure of environmental impact assessment¹¹².
- On 9 February 2001, the Ministry of the Environment answered that request by ordering Enel Produzione to follow the V.I.A. procedure¹¹³.
- Enel Produzione, therefore, immediately initiated the procedures to fulfil the requirements provided for by the procedure of environmental impact assessment legislation¹¹⁴.

Report prepared by ISPRA found that "at the Enel Polesine Camerini Thermo-Electric Power Plant the dust emitted with the combustion flue gases were abated through the use of an electro-filter (or electrostatic precipitation) located immediately downstream from the combustion air pre-heaters. Inside of the electro-filter a containment area is created with an estimated volume of about 5000 m³ where the flue gases, being nearly stationary (speed less than 1m/s), go through the system of electrodes and flat surfaces. The dust particles, becoming polarized by effect of the electric charge, are trapped on the capturing surfaces. The particulate removal efficiency, generally greater than 90%, is influenced by their size and resistance."

¹¹² See letter Enel Produzione 3 August 2000 signed by Alfredo Inesi, Annex 8 to Prof. Pasquon's Expert Witness Technical Report, and Witness Mr. Urbani, pp. 12 and 13 transcript of hearing on 25 November 2013.

See letter 9 February 2001 signed by Mariarosa Vittadini, Annex 16 to Prof. Pasquon's Expert Witness Technical Report, and Witness Mr. Urbani, pp. 14 and 15 transcript of hearing on 25 November 2013.

See Witness Mr. Urbani, p. 16 transcript of hearing on 25 November 2013.

- Enel Produzione on 17 September 2001 again requested permission from the competent agencies to accelerate the DESOX plants construction times to be exonerated from the V.I.A. procedure and at the same time submitted a new environmental upgrade project for the power plant that included the installation, apart from the desulfurization plant, also of a denitrification plant¹¹⁵.
- On 30 October 2001 the Ministry of the Environment reiterated to Enel Produzione the need to submit the new environmental compliance plan as well for the Porto Tolle power plant for the environmental impact assessment process. That decision was linked, *inter alia*, to the "production cycle of the DESOX plants and the pertinent movement of significant quantities of materials and products" and to the "size of the new DENOX plants in line with those of the existing power plant".
- A few days after the Ministry of the Environment issued its final position, Enel Produzione started the environmental impact assessment process, presenting the relevant report¹¹⁷.

In the light of the foregoing it is quite evident that Mr. Scaroni cannot be blamed at all with reference to the failure to adopt plants aimed at reducing SO₂ and NOX emissions given that, in May 2002, the Ministry itself was in the process of conducting an assessment regarding the request made by Enel Produzione to modify the Power Plant including the introduction of such plants.

3) The prosecution further maintains that there was supposedly an intentional failure to use sulphur-free fuel in the Porto Tolle Power Plant.

¹¹⁵ See the letter of 17 September 2001 signed by Inesi, Annex no. 22 to the expert witness technical report of Prof. Pasquon, as well as the witness Urbani on pp. 17 and 18 of the transcript of the hearing of 25 November 2013.

¹¹⁶ See the letter of 30 October 2001 signed by Vittadini, Annex no. 23 to the expert witness technical report of Prof. Pasquon, as well as the witness Urbani on p. 19 of the transcript of the hearing of 25 November 2013.

¹¹⁷ See the letter of 13 November 2001 signed by Inesi, Annex no. 24 to the expert witness technical report of Prof. Pasquon.

Actually much documentary and witness evidence has emerged that, beyond any doubt, demonstrates that, starting from the end of the 90's, there was a clear shortage of sulphur-free fuel oil on the market.

In its 22 September 2000 letter sent to the Ministry of Industry and Trade, thus at a time quite earlier than the commencement of the present criminal proceedings, Enel Produzione had already highlighted the serious problems in procuring sulphur-free fuel.

In that document one reads that "sulphur-free fuel oil is produced almost entirely by Libya and Indonesia, which have very light crudes and export approximately 5000 Kt/year thereof each. Sulphur-free fuel oil is produced occasionally by other bases but in modest amounts and often with irregular quality.

A number of conditions and contributing factors have dramatically reduced the availability of sulphur-free fuel oil on the global market.

In particular, Enel Produzione has to cope with the conditions of a shortage of this type of fuel because of:

- a reduction in Libyan supply (well below the contractual commitments) for technical reasons;
- a diversion of the Indonesian product due to use in bordering countries undergoing strong economic expansion;
- a prohibition against exporting fuel oil from Kazakhstan to encourage the domestic market;
- market scarcity of supplies of sulphur-free fuel oil loads due to high demand caused by high prices of crude and by the good performance of sulphur-free fuel oil.

The persistent conditions of an international shortage of sulphur-free fuel oil already make meeting the needs of the La Casella and Torrevaldaliga Nord thermoelectric power plants problematic in a scenario where, among other things, there is still unsatisfied demand for the commissioning of such plants by the Grid Operator" 118.

The content is identical in the letter dated 25 September 2000 signed by Inesi and sent

¹¹⁸ See Annex no. 11 to the expert witness technical report of Prof. Pasquon.

by Enel Produzione to the Veneto Region¹¹⁹.

In the services conference of 26 October 2000, to which representatives of both the Ministry of Health and the Ministry of the Environment were invited, there was again acknowledgement of the difficulties of procuring sulphur-free fuel oil. The shortage of sulphur-free fuel on the market continued over the coming years as well, as also shown in the minutes of the services conference of 21 May 2003 where the Ministry of Production recognised that "regarding the use of fuels that can assure minimal emissions, such requirement can only lead to the use of sulphur-free fuel oil, but such oil proves to be characterised by intrinsic difficulties, however, not least among them the fact that it is hard to find, which conflicts with the need to ensure the optimal operation of the plants involved and to guarantee the level of reliability and continuity in operation that is required by the National Transmission Grid Operator (GRTN)" 120.

The clear difficulty in procuring sulphur-free fuel in the years under examination was also demonstrated by the oral depositions of witnesses and expert witnesses. The witness Camponeschi fully described the situation on the sulphur-free fuel market¹²¹.

In summary, the following emerged from his deposition.

- sulphur-free fuel is only produced in some parts of the world.
- Enel had entered into an agreement with the Italian refinery (IPLOM) which however only guaranteed a minor portion of Enel needs.
- the sulphur-free fuel purchased by Enel (in the years under examination) was unsufficient to satisfy all of the Enel power plants that operated using sulphur-free fuel as also

¹¹⁹ See Annex no. 12 to the expert witness technical report of Prof. Pasquon; see also the letter of the Ministry of Trade of 13 November 2000, as well as the Services Conference minutes of 26 October 2000, Annex no. 15 to the technical report of Prof. Pasquon. In his expert witness technical report Prof. Pasquon noted that "the Ministry of Industry, upon considering the opinion of the Ministry of the Environment and the authorities involved, by decree of November 2000 authorised operation with low-sulphur fuel for a temporary period of four months at the Torrevaldaliga Nord Power Plant in Civitavecchia, where the use of sulphur-free fuel had become mandatory as a result of the declaration of completion of environmental compliance" (see p. 34).

¹²⁰ See Annex no. 54 to the technical report of Prof. Pasquon.

See the transcripts of the hearing of 9 December 2013, pp. 14, et seq.

emerges from the letters mentioned above – to such an extent that, the witness stated: "if", in theory, "all of the sections had been operating" (sections of the Porto Tolle Power Plant) "we would not have had a sufficient quantity of fuel to feed them" 122. The witnesses Fano 123, Vagliasindi 124 and Urbani 125 also repeatedly noted the shortage of sulphur-free fuel on the market.

Lastly, see also the expert witness technical report of Prof. Pasquon.

"The use of sulphur-free fuel in Sections 1, 2 and 3 of the thermoelectric power plant has been hampered by the **limited availability of this fuel on the global market**.

The reduced availability of sulphur-free fuel oil on the global market has arisen from a number of conditions and contributing factors.

In particular, already in 2000 ENEL Produzione had to cope with the conditions of a shortage of this type of fuel because of:

- a reduction in Libyan supplies (well below the contractual commitments) for technical reasons;
- confinement of the Indonesian product to use in bordering countries undergoing strong economic expansion;
- prohibition against exporting fuel oil from Kazakhstan to encourage the domestic market;
- market scarcity of supplies of sulphur-free fuel oil loads due to high demand caused by high prices of crude and the good performance of sulphur-free fuel oil.

It is to be noted that sulphur-free fuel oil is produced almost entirely by Algeria, Libya and Indonesia, which export approximately 5000 Kt/year each. Sulphur-free oil is also produced occasionally by other bases but in modest amounts and often with irregular quality. In Italy, sulphur-free fuel is produced in limited quantities by the Busalla IPLOM refinery, from which, since 1997, ENEL has received about 500,000 t/year, an amount that is roughly equivalent to the consumptions of Section 4 of the Porto Tolle thermoelectric power plant.

¹²² See the transcripts of the hearing of 9 December 2013, p. 14.

See the transcripts of the hearing of 2 December 2013, pp. 90 and 103.

See the transcripts of the hearing of 2 December 2013, p. 13.

See the transcripts of the hearing of 25 November 2013, pp. 11, 12 and 20.

Since 1994 it was thought, a priori, that it was possible to obtain sulphur-free fuel from North Sea oil. It was afterwards determined that this was not possible due to the characteristics of the crude coming from that area.

Refineries are now required to produce fuels (petrol and gas oil for diesel engines) with increasingly lower levels of sulphur. The result of this is that an ever more significant share of sulphur-free fuel is destined for the production of fuels, to the detriment of the share destined for thermoelectric power plants". 126

In light of the afore-mentioned evidence, it is clear that the alleged failure to use sulphur-free fuel in Groups 1, 2 and 3 of the Power Plant solely resulted from the difficulties in finding it. It goes without saying that the little sulphur-free fuel that Enel succeeded in purchasing was used only at the power plants and at the groups that – by regulatory provision – could only be fed such fuel.

In other words, it would not have made sense to use sulphur-free fuel in Groups 1, 2 and 3 of the power plant (which were authorised to operate with low-sulphur or medium-sulphur fuel oil), which would risk leaving "uncovered" groups (such as Group 4 of the Porto Tolle power plant) or power plants (for example, La Casella and Torrevaldaliga) that could – by law – be fed only fuel with extremely low sulphur content.

The witnesses referred to above have also made clear why, since 2005, the Porto Tolle Power Plant, on the other hand, had been able to use sulphur-free fuel at all four groups.

Regardless of the fact that, from 2005 onwards, the Power Plant has been called upon to produce energy to a much lower extent than before (and it basically shut down after the first half of 2006), it so happened that the greater availability of sulphur-free fuel created by virtue of the conversion of many power plants to combined cycle (operating previously with fuel oil) "freed up" a sufficient

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¹²⁶ See the expert witness technical report of Prof Pasquon, p. 24; also see the transcripts of the hearing of 9 December 2013, pp. 122, *et seq*.

amount of fuel for the Power Plant's modest production. 127

In conclusion, with regard to the failure to use sulphur-free fuel in Groups 1, 2 and 3, the Public Prosecutor has put forward to the court the supposition that this occurred because of a desire for savings.

But that is just an assumption devoid of any specific supporting evidence.

On the contrary, it has been demonstrated that it was objectively impossible for Enel to rely on the availability of such fuel in the years 2000-2005 and that this is what caused the failure to use sulphur-free fuel at Groups 1, 2 and 3 of the Power Plant.

In other words, to use the words of the person in charge of the fuel unit at Enel, Camponeschi, "no availability of sulphur-free fuel to operate all of the plants using oil existed so, under those circumstances, the Porto Tolle sections that had not yet used sulphur-free fuel, that is, Sections 1, 2 and 3, considering that the fourth one had already been using it since 1999, were declared not available for operation because there was no availability of fuel to feed them with so that they could operate." 128

It has been ultimately shown, in Mr. Scaroni's reference period (2003-2004), that Section 4 (that is, the one that had been using sulphur-free fuel) was in operation for a number of hours that totally matched the other groups, as can be seen in the table set forth below.

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¹²⁷ See the witness Fano, transcripts of the hearing of 2 December 2013, p. 57. See also the expert witness technical report of Prof Pasquon, p. 39.

See the transcripts of the hearing of 9 December 2013, p. 21.

Ore di funzionamento							
anno	sezione 1	sezione 2	sezione 3	sezione 4 totale			
1999	6.085	6.085	7.327	6.128	25.625		
2000	6.725	6.629	6.689	3.885	23.928		
2001	6.356	6.574	6.138	2.999	22.067		
2002	5.274	6.204	6.513	4.559	22.550		
2003	3.069	3.257	4.349	5.069	15.744		
2004	2.983	2.705	2.984	2.363	11.035		
2005	1.194	318	966	2.195	4.673		
2006	1.660	0	1.274	2.032	4.966		
2007	86	0	725	572	1.383		
2008	165	0	159	526	850		
2009	0	0	1	180	181		
2010	0	0	0	0	0		
2011	0	0	0	0	0		

When considering this issue as well, one cannot see how the conduct of Mr. Scaroni could be deemed to be even characterized by the presence of general fault.

Besides the arguments set forth above, there is further evidence that shows the absolute absence of the subjective element necessary to allege the existence of the crime of disaster.

First of all, it is appropriate to highlight the structure of the Enel Group, headed by Mr. Scaroni from the end of May 2002 up to the early months of 2005.

The joint stock company Enel S.p.A. is the holding company of the Group. That is, it is the structural but not operational holding company of one of the most important Italian economic entities, with activities and operations in many sectors both in Italy and abroad, so the managing of such an enterprise obviously requires a precise distribution of tasks and responsibilities within each of the divisions, companies, operating areas and production units that comprise the Group, with the consequent attribution of the respective functions based on a detailed and specific corporate structure. In sum, the following has emerged from the documents and testimony produced.

The Enel Group was divided into the following divisions¹²⁹:

- Generating and Energy Management Division;
- Market Division;
- Infrastructures and Networks Division;
- Telecommunications Division;
- Business Services and Diversified Activities Division.

In addition to these Divisions, the Enel Group included the joint stock company Terna S.p.A..

Each of these divisions was comprised of several companies of large size (consider, for example, that the "Telecommunications Division" included the company Wind and that the "Infrastructure and Networks Division" included the companies Enel Distribuzione and Enel Distribuzione Gas, as well as that the "Market" area included the company Enel Vendita Gas).

The one involved here is the Generating and Energy Management Division (GEM), which in 2002 indeed included seven Italian and foreign companies, among them Enel Produzione S.p.A.

Within the GEM Division and, in particular, Enel Produzione S.p.A., there were then numerous Business Areas. Considering what is pertinent in the present proceedings, the "Thermoelectric Production" and "Facilities Development" Areas are notable.

The former had as its specific function "the operation and maintenance of the park of Italian thermoelectric plants", and the latter, in turn, had as its specific task "the conversion and completion of thermoelectric plants in Italy and abroad".

In particular, the tasks conferred to the "Thermoelectric Production" Area were the following:

- "- to oversee the operation and maintenance of the plants according to the objectives established, with responsibility concerning operating costs and their technical performance (availability, thermal efficiency, etc.);
- <u>to provide to the Technical Facilities Development Area the elements for a technical assessment</u>

¹²⁹ See Organisational Decision no. 51 of 8 July 2002, Organisational Decision no. 60 of 19 December 2002, and Organisational Decision no. 1 of 31 March 2003, with the relevant company organisational chart. See the witness Vagliasindi, transcripts of the hearing of 2 December 2013, pp. 7 and 69, *et seq*. See the witness Fano, transcripts of the hearing of 2 December 2013, pp. 111, *et seq*.

of the work to be carried out to bring the technical and economic performance of the facilities in line with international best practices and to define and complete the work of environmental compliance;

- to agree with the Business Power Area on the plants scheduling and estimating fuel consumptions;
- to ensure the efficient operation and maintenance of the secondary logistics infrastructures for the fuel".

With regards to the "Facilities Development" Technical Area, the tasks conferred to it were the following:

- "- to design and define the specifications involving the new thermoelectric plants and the significant transformations of the existing ones, as well as the management of the calls for tender;
- to manage the relations with the main contractors, checking the progress of the work (times, costs), testing and performance verification;
- to provide, to all of the organisational units involved, the know-how necessary for putting the performance of the facilities in line with international best practices, monitoring the technological improvements used on the international level;
- to support the Thermoelectric Production and Renewable Energies Business

 Areas in the environmental field to resolve operational problems;
- to support the Thermoelectric Production Business Area in managing relations with Public Bodies;
- to carry out studies and research to increase the competitiveness of the thermoelectric plants, improving their operating performance and environmental compatibility."

Lastly, has to be noted the existence of an autonomous Business Area called "Fuel" that had the specific task of procuring, among other things, liquid fuels for the Group.

The "Thermoelectric Production" Area, in turn, was divided into multiple Areas (Oil and Gas Area, Coal and Orimulsion Area, Combined-Cycle and Turbogas Area).

The person in charge of the Oil and Gas Area, which included the production unit comprised of the Porto Tolle Power Plant, had 10 power plants under his control. Among them was the Porto Tolle Power Plant as well.

In essence, between the Managing Director of Enel S.p.A. and the Manager of Porto Tolle Power Plant, there were the following people: the head of the GEM Division, the Managing Director of the company Enel Produzione S.p.A. and, within the latter, the head of the "Thermoelectric Production" Area and the head of the Oil and Gas Production Area, which included the Porto Tolle Power Plant. It is thus appropriate to note that, alongside this vertical line, so to speak, there was a specific Area (Facilities Development) meant to monitor the "technological improvements" used to ensure "performance of the facilities in line with international best practices" as well as "to support the Thermoelectric Production Business Area in the environmental field for the resolution of operational problems", with the aim of ensuring the "environmental compatibility" thereof.

Within the scope of the holding company (Enel S.p.A.), among the Staff Functions, there was also a responsible for Environmental Policies (Fano).

Considering the organisational structure thus described, when assessing the subjective element with pertinence to Mr. Scaroni, the testimonies of Vagliasindi, Fano and Urbani assume decisive importance. Vagliasindi, at Enel Produzione S.p.A., head of the "Thermoelectric Production Area" (from which stemmed the "Oil and Gas Production" line, a part of which was the Porto Tolle Power Plant), has stated (and several times repeated) during his examination that he was not aware of any report concerning problems arising from pollution of the air in the area of Porto Tolle nor even critical situations involving the health of population¹³⁰.

¹³⁰ See the transcript of the hearing of 2 December 2013: "Defence attorney de Castiglione – Thank you, but I would just like to know whether, in your position as person in charge, so to speak, of what we may call the Thermoelectric Area of Enel, you ever got indications, signals or any type of problematic situation concerning air quality in the Porto Tolle area? - Witness Vagliasindi – No, not that I am aware of" (...) "Witness Vagliasindi – I have said that I never received any reports that there were situations at the Porto Tolle Power Plant of such particular nature as would come to my attention" (...) "Prosecutor –

Moreover, both Vagliasindi and Fano (in charge of Environmental Policies at Enel) knew that the Enel control units' tracking data was not indicating exceedances of the limits prescribed by the rules for air quality¹³¹.

Urbani also mentioned that the values gathered from the Enel control units were "extremely low" and showed "full compliance with the limits at all stations of the air quality monitoring network. "132

The following is set forth, in conclusion.

On the one hand, the Public Prosecutor has not provided any evidence that the alleged – but not demonstrated – air pollution caused by the operation of the Power Plant was known to Mr. Scaroni.

On the other hand, there is indeed proof to the contrary, given that not even Enel executives – in particular Vagliasindi (at the top of the line over the Porto Tolle Power Plant), Fano (in charge of Enel's Environmental Policies) and Urbani (heading the Environment and Authorisations function) – who over the years had closely monitored the Porto Tolle Power Plant were aware of the critical environmental situations and of the risks to the health of the population. So, even assuming – but not conceding – that one were to find that the objective element of the crime provided for by Art. 434 of the Criminal Code is present, one cannot allege that the conduct constituting acts and omissions as charged against Mr. Scaroni was carried out culpably, and much less so with the intent necessary for the charge brought.

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Did you ever receive a report of the consultations, so to speak, that recognised the fact that there was a lichen rarefaction, that – although indeed we are not only concerned about lichens but, rather, it was because they are a sign of how flora in general are doing - there was a change there in biodiversity during the years when the Power Plant had been operating in the zones, so did you ever get a report about that? – Witness Vagliasindi – No'' (...). "Prosecutor – With regard to the respective problems, in the period when you were there, of possible links with atmospheric emissions, given that there were several tons of SO₂, as there then were dusts and as there then were nitrogen oxides, and respiratory problems or, in any event, other health problems for the population, did you ever hear talk about that? - Witness *Vagliasindi – No*" (pp. 23, 24, 38, 39, 52 and 53).

¹³¹ See the transcript of the hearing of 2 December 2013: "It does not appear that these control units ever indicated situations of a particular nature, so to speak ... here or otherwise ... no situations were ever indicated to us, whether at Porto Tolle or, I must say, at any other Italian power plants" (see the witness Vagliasindi, p. 25); "Defence attorney de Castiglione – I ask you, and I specify that I ask with regard to the data from the control units that were providing objective data deriving from the control units out in place by Enel, were there any worrying data? – Witness Fano – As far as I remember, no" (see the witness Fano, p. 113).

132 See the transcript of the hearing of 25 November 2013, page 40.

The undersigned defence attorneys understand the seriousness of the task this court has been called upon to examine and assess numerous and complex technical issues.

However, it is believed by the undersigned that a careful and thorough examination of what emerges in the proceeding must result in an acquittal of Mr. Scaroni with the fullest possible exculpation.

The judgment of the Court of Rovigo, Separate Adria Section, has already discounted any liability on the part of Mr. Scaroni with regard to the environmental damage that had been charged against him.

In light of what has emerged in the arguments, it is impossible, in any event, to assert that there has been a removal of injury-prevention protections.

Likewise, no certain evidence exists that would allow one to assert, beyond any reasonable doubt, that there has been an increase in hospitalisations of children residing in the areas surrounding the Power Plant for respiratory diseases during the last months of 2002 (although this also applies to the preceding months and years) or even any concrete danger to public safety.

So, even to just theorise that the conduct of Mr. Scaroni may have been motivated by the intention to create a danger to the health of the population or even just to accept the risk thereof is something that runs counter to the evidence obtained in the proceeding and counter to rational credibility.

Therefore, we are confident that this court will acquit Mr. Scaroni, with full exculpation, of the crimes alleged against him.

Respectfully, In Milan/Rovigo, on 17 February 2014

(Enrico de Castiglione, Esq.) (Alberto Moro Visconti, Esq.)

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Periodo	Period		
Postazioni	Stations		
Tabella 8.2: Medie annuali delle concentrazioni di	Table 8.2: Average annual concentrations of		
SO ₂ misurate nelle stazioni di monitoraggio	SO₂measured at the monitoring stations		
Concentrazione media di SO ₂ nell'anno considerato	Average concentration of SO ₂ in the year under		
	consideration (μg/mc)		
Pag. 37	P. 37		
Tab. 1.1 Limiti normativi di qualita` dell'aria per	Table 1.1 Regulatory limits of air quality for		
l'anidride solforosa (SO ₂)	sulphur dioxide (SO ₂)		
Periodo	Period		
1971-1983 (DPR 322/1971, Art. 8))	1971-1983 (DPR 322/1971, Art. 8))		
1983-1988 (DPCM 28/5/1983, All 1)	1983-1988 (DPCM 28/5/1983, Annex 1)		
1988-2002 (DPR 203/1988, All 1))	1988-2002 (DPR 203/1988, Annex 1))		
2002-2010 (DM 60/2002, All.1))	2002-2010 (DM 60/2002, Annex 1))		
2010- vigente (DL 155/2010, All. XI)	2010- present day (DL 155/2010, Annex XI)		
Limite per effetti acuti (μg/m ⁻³)	Limit for acute effects (µg/m ⁻³)		
790 (media di 30 minuti)	790 (average of 30 minutes)		
250 (98° percentile delle medie di 24 ore in un	250 (98 th percentile of 24-hour averages in one		
anno)	year)		
250 (98° percentile delle medie di 24 ore	250 (98 th percentile of 24-hour averages in one		
nell'anno)	year)		
350 (media oraria, da non superarsi per piu` di 24	350 (hourly average, not to		
volte/anno, a partire da 2005)	be exceeded more than 24 times per year, from		
Margine di tolleranza: 150 μg/m ⁻³ partire	2005)		
dall'entrata in vigore della direttiva 99/30/CE	Tolerance margin: 150 μg/m ⁻³ from the entry into		
(19/7/99). Tale valore e`ridotto il 1° gennaio 2001,	force of directive 99/30/EC (19/7/99). This value		
e successivamente ogni 12 mesi secondo una %	was reduced from 1 January 2001, and		
annua costante, per raggiungere lo 0% il 1°	subsequently every 12 months in accordance with		
gennaio 2005.	a constant annual percentage, to reach 0% by 1		
	January 2005.		
350 (media oraria, da non superarsi per piu` di 24	350 (hourly average, not be exceeded more than		
volte/anno, a partire da 2005)	24 times per year, from 2005).		
Limite per effetti cronici (µg/m ⁻³)	Limit for chronic effects (μg/m ⁻³)		
390 n(media di 24 ore)	390 n (24-hour average)		
80 (mediana delle medie di 24 ore in un anno)	80 (median of 24-hour averages in one year)		

80 (mediana delle medie di 24 ore in un anno)	80 (median of 24-hour averages in one year)
130 (mediana delle medie di 24 ore in inverno)	130 (median of 24-hour averages in one year)
125 (media di 24 ore, da non superare per piu` di 3	125 (24-hour average, not to be exceeded more
volte/anno, partire dal 2005)	than 3 times per year, from 2005)
20 (media annuale per la protezione degli	20 (annual average for the protection of
ecosistemi)	ecosystems)
125 (media di 24 ore, da non superare per piu` di 3	125 (24-hour average, not to be exceeded more
volte/anno, partire dal 2005)	than 3 times per year, from 2005)
20 (livello critico della media annuale per la	20 (critical level of the annual average for the
protezione della vegetazione)	protection of vegetation)
20 (livello critico della media invernale per la	20 (critical level of the winter average for the
protezione della vegetazione, dal 19/7/2001)	protection of vegetation, from 19/7/2001)
protezione dena vegetazione, dai 13/1/2001/	protection of vegetation, from 15/7/2001/
(*) DPR 322/71 per le industrie. In qualunque	(*) DPR 322/71 for industry. At any point outside
punto esterno ai perimetri industriali	the industrial perimeters.
Livello ambientale di biossido di zolfo (SO ₂)	Environmental level of sulphur diovide (SO)
Gli indicatori prescelti per il Rapporto sugli	Environmental level of sulphur dioxide (SO ₂) The indicators chosen for the Report on the
	·
indicatori ambientali del Veneto 2002 dell'ARPAV	environmental indicators of ARPAV Veneto 2002
sono il valore del 98° percentile delle medie di 24	are the value of the 98 th percentile of the 24-hour
ore nel periodo annuale (01/04/2000 –	averages in the annual period (01/04/2000 –
31/03/2001) e del 50° percentile delle medie di 24	31/03/2001) and the 50 th percentile of the 24-hour
ore nel periodo invernale (01/10/2000 –	averages in the winter (01/10/2000 – 31/03/2001)
31/03/2001) per ciascuna centralina e a livello	for each power plant and at province level
provinciale (media dei dati delle centraline).	(average of power plant data).
Come rilevato nel Rapporto ARPAV, da molti anni,	As revealed in the ARPAV Report, for many years,
a seguito della metanizzazione degli impianti di	following the conversion to methane combustion
riscaldamento e della riduzione del tenore di zolfo	of the heating plants and the reduction in the
nei carburanti per autoveicoli, questo indicatore	content of sulphur in vehicle fuels, this indicator
ha perso importanza, in quanto i valori rilevati	has lost importance because the figures measured
risultano inferiori ai limiti e ai valori guida della	are lower than the limits and the guideline values
qualita` dell'aria.	for air quality.
Gli indicatori, infatti, mostrano livelli di SO ₂	In effect, the indicators show levels well below the
ampiamente al di sotto dei valori limite indicati dal	limit values indicated by DPR 203/88 (250 and 130
DPR 203/88 (250 e 130 µg/m³).	μg/m³).
	F-0/ · · · /-
Localita`	Location
Provincia	Province
98° percentile media 24 h annuale (250 μg/m³)	98 th percentile 24h annual average (250 μg/m³)
50° percentile media 24 h invernale (130 μg/m³)	50 th percentile 24h winter average (130 μg/m³)
Fonte: ARPAV, Dipartimento Provinciale di Rovigo	Source: ARPAV, Provincial Department of Rovigo -
- anno 2001.	2001
Centralina ENEL Scardovari	ENEL Scardovari power plant
SO2 (μg/m³)	SO ₂ (μg/m ³)
Misurazione medie giornaliere dal 1° gennaio 2001	Daily average measurements from 1 January 2001
_	, ,
i al 31 dicembre 2002	to 31 December 2002
al 31 dicembre 2002	to 31 December 2002
Fig 8. Massimi valori delle concentrazioni medie	Fig. 8 Maximum values of average annual

Output CALPUFF	CALPUFF output
Massimi di dominio delle concentrazioni medie	Area maximums of annual average concentrations
annue (µg/m³)	(μg/m³)
PTS	PTS
0.35	0.35
0.30	0.30
0.25	0.25
0.20	0.20
0.15	0.15
0.10	0.10
0.05	0.05
0.00	0.00
0.00	0.00
Fig 9. Valori medi di dominio delle concentrazioni	Fig. 9 Area average values of annual average
medie annue di NO ₂ , SO ₂ e PTS – anni 2000-2006	concentrations of NO ₂ , SO ₂ and PTS – 2000-2006
[Fonte: output modellistici]	[Source: modelling outputs]
Output CALPUFF	CALPUFF output
Medie di dominio delle concentrazioni medie	Area averages of annual average concentrations
annue (µg/m³)	(μg/m³)
ainue (μg/iii)	(με/ 111)
PTS	PTS
0.06	0.06
0.05	0.05
0.04	0.04
0.03	0.03
0.02	0.02
0.02	0.01
0.00	0.00
NO ₂ , SO ₂	NO ₂ , SO ₂
3.0 2.5	3.0
	2.5
2.0	2.0
1.5	1.5
1.0	1.0
0.5	0.5
0.0	0.0
0.2	0.3
0.3	
1.9	1.9
0.05	0.05
2.3	2.3
0.04	0.04
0.4	0.4
2.7	2.7
0.05	0.05
0.2	0.2
0.6	0.6
0.02	0.02
0.1	0.1
0.5	0.5
0.02	0.02

0.0	0.0
0.1	0.1
0.004	0.004
0.005	0.005
Ore di funzionamento	Operating Hours
anno	Year
Sezione 1	Section 1
Sezione	Section 2
Sezione	Section 3
Sezione	Section 4
Totale	Total

Criminal case no. 20/13 - no. 3946/08 in the Court R.G. (General Register) Technical Report Air Quality in the area around the ENEL Plant at Porto Tolle

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1. Introduction

This report contains an analysis of the data on air quality recorded for various purposes in the area around the ENEL thermoelectric plant in Porto Tolle ("ENEL Plant") with a view to providing a critical evaluation based on the data used by the technical advisers to the Public Prosecutor ("Technical Advisers"). Specifically, in estimating the exposure and possible health effects on the population, the Technical Advisers identified the presence of sulphur dioxide (SO2) in the atmosphere and of the bioaccumulation of vanadium (V) in lichens, as risks to the health of the exposed individuals (Scarselli, Crosignani and Magnani – 2011 Technical Report in case no. 08/003946).

Since the issue of the first specific measures on atmospheric pollution (Presidential Decree 322/1971), Italian legislation has adopted reference values for the main pollutants, which continue to represent (Leg. Decree 155/2010) the acceptable limits for air quality to protect human health. Ministerial Decree 60/2002 and Legislative Decree 183/2004 also introduced limits to protect vegetation against the excess presence of sulphur dioxide and ozone. The limits subsequently introduced as the law has evolved are all based on the risk values for exposed individuals, deemed by the legislator to be acceptable to the public based on the knowledge of that time. A prime example of this is the evolution of standards for sulphur dioxide, one of the principal pollutants regulated by limits (Table1.1):

Table 1.1 Legal limits on air quality for sulphur dioxide (SO₂)

Period	Limit for acute effects	Limit for chronic effects		
	(μg m ⁻³)	(µg m ⁻³)		
1971 -1983 (PRES. DECR.	790 (average of 30 minutes)	390 (average of 24 hours)		
322/1971, Art. 8)				
1983 -1988 (Decr. of	250 (98th percentile of 24-hour averages in a year)	80 (median of 24-hour averages		
President of Council of		in a year)		
Ministers 28/5/1983,				
Appendix 1)				
1988 - 2002 (PRES.	250 (98th percentile of 24-hour averages in a year)	80 (median of 24-hour averages		
DECR. 203/1988,		in a year) 130 (median of		
Appendix 1)		24-hour averages in winter)		
2002 - 2010	350 (hourly average, not to be exceeded more than 24 times a	125 (average of 24 hours, not to		
(DM 60/2002, All.1)	year, from 2005 onwards)	be exceeded more than 3 times		
	Margin of tolerance: 150 μg m ⁻³ from the entry in force of	a year, from 2005 onwards)		
	Directive 99/30/EC (19/7/99). This value was reduced on 1	20 (annual average for the		
	January 2001, and then every 12 months according to a	protection of ecosystems)		
	constant annual %, falling to 0% on 1 January 2005.			
2010 - present (Leg. Decr.	350 (hourly average, not to be exceeded more than 24 times a	125 (average of 24 hours, not to		
155/2010, Appendix XI)	year, from 2005 onwards)	be exceeded more than 3 times		
		a year, from 2005 onwards)		
		20 (critical level of annual		
		average for the protection of		
		vegetation)		
		20 (critical level of annual		
		average for the protection of		
		vegetation, from 19/7/2001)		

(*) Pres. Decr. 322/71 for industries. At any point outside the industrial perimeters.

All the subsequent laws, until the last one (Legislative Decree 155/2010) which was updated to reflect the most recent scientific knowledge in the sector, have consistently repeated the measures and well-defined methodologies that form the basis for all intervention by the regulatory bodies. In particular, situations posing a risk to health due to the overrun of the above limits, which thus lead to recovery plans and to the obligation for the local authorities to report immediately to the Ministry and the European Community, **must only be identified, in all cases, with measurements**. Therefore, in identifying the overrun of limit values for the protection of health and critical levels for the protection of vegetation, no formal role has been given to alternative air quality recording techniques (the lichen biodiversity index for example) other than a measurement of the concentration of the pollutant using the certified methods and protocols indicated in the law.

The most recent law on this issue (Legislative Decree 155/2010) also considers the contributions that may result from estimation techniques. In other words, mathematical models used to calculate concentrations over time, in locations other than the point of measurement in areas that have already been identified as compliant with the limits, but always based on measured values that can in some way validate the chosen mathematical models. Although the most advanced versions of these models are a valuable quality management tool, they cannot be used to evaluate – with the necessary rigour – any overrun of limits for the protection of human health, much less the exposure of communities, due to the general uncertainty that derives from a combination of individual uncertainties linked to the input data:

- an estimate of the data on emission (which is often obtained in terms of average or constant values, as in this case);
- meteorological parameters (which are intrinsically uncertain, especially if obtained from a few measurements referring to different times and locations);
- the mathematical structure of the model (which is intrinsically uncertain, as it simplifies complex phenomena such as the transport and diffusion of pollutants, their transformation and removal, the temporal and spatial mediation of concentration values in order to describe these phenomena in a mathematical formula). The uncertainties demonstrated by the models for short-term concentration estimates (typically hourly concentrations) are particularly significant.

Added to this is the fact that the results of the models are always precautionary, as they rely on parameters, which tend to represent situations that reasonably are less favourable.

We can conclude that the measurement of concentrations is the essential, irreplaceable knowledge necessary to evaluate a population's exposure to pollutants. It is carried out using a recognised method and is compared with the reference values that have been available under Italian law since 1983. However, there is a series of pollutants – generally micro-pollutants specific to localised human activity – which do not have regulatory limits, even though they are present in the environment and are potentially harmful (such as vanadium). Without such limits, the assessment of the risk of exposure is based on the measurement of the concentration of the pollutant in the atmosphere or deposited in the soil, compared with approved international benchmarks such as the guidelines of the World Health Organisation (WHO Air Quality Guidelines for Europe, 2000 - Second Ed.).

2. Database for the epidemiological study

The database used "... in the epidemiological study to evaluate possible health effects linked to the quality of the air in the site around the ENEL Plant..." (Scarselli, Crosignani and Magnani – 2011 Technical Report in case no. 08/003946) consists of:

- 1) the results of model-based simulations of the fallout of sulphur dioxide and nitrogen oxides in the area, carried out by ARPAV (Regional Environmental Protection Agency of Veneto) (ARPAV *Model-based simulation of fallout from the ENEL Plant, 2000-2006*, in support of Provincial Department of Rovigo, 2010. Case no. 3946/2008);
- 2) indirect indications of the presence of vanadium and sulphur oxides in the atmosphere, from measurements of lichen biodiversity and bioaccumulation in 2003 (Scarselli et al *Monitoring of atmospheric contamination around the ENEL Plant at Porto Tolle 2003.* Technical Report 1, Proceedings no. 3577/2001).

2.1 Model-based simulations

No measurement data produced by the ENEL network, by the ARPAV network, by ARPAV mobile stations or by any other body has been taken into consideration.

This approach is in itself extremely surprising. This is one of the most closely-monitored areas in Italy, and as will be seen below, the epidemiological study is not based on the concentration values of the pollutants that were actually measured and are directly connected to the exposure of individuals and can thus be compared with the current air quality limits to protect human health. However, substitute parameters have been used (model-based results and indicators of lichen biodiversity and bioaccumulation). These parameters do not only have intrinsic limitations, which have been admitted by the Technical Advisers themselves (incomplete environmental data, ARPAV's simplified application of the model and uneven distribution of the exposed population) (Scarselli, Crosignani and Magnani *2011 Technical Report*, case no. 08/003946, p. 9 - Limitations

of the study). Due to the purely evidentiary nature of these assessments, the data is also poorly suited to the use to which it has been put, in other words firstly as a prompter and secondly as a database for the epidemiological study.

First of all, for the reasons mentioned above, it is proper practice to use the results of models as a support for the measurements, and under no circumstances as substitutes on crucial matters such as identifying the overruns of limits to protect human health and critical levels of exposure. This for the mere fact that, as mentioned above, all the calculation methods are precautionary and tend to deliberately overestimate the concentration values. Furthermore, even admitting that the models are based on quality-certified input data (emissions and meteorological data) and algorithms for which the intrinsic uncertainty in the sequence of operations is known, it is essential that for important applications, site-specific validations are used to confirm the accuracy of response. In other words, operations that allow a comparison of the values estimated by the model against the values actually measured at representative points, in order to verify the limits and the reliability of the application and if necessary calibrate the model with the measured data. With the ARPAV model-based simulation, the on-site validation, which would have been permitted by the available measurement data, does not appear to have been carried out. From other angles, the application appears to be overly restrictive because of two important options that are penalising beyond all reasonable caution:

- 1) the unjustified decision to consider the 4 flues inside the chimney stack separately, and not as a single chimney, as the physical reality would indicate;
- 2) the decision to use a constant flow of fumes in calculating the emissions, whereas there was data recorded on the system that could have been used to give an accurate flow estimate (the SME records provided by ENEL, Enel-PR0-04/05/2010-0017411). These two unmotivated assumptions, which underestimate the rise in plume height and overestimate the emissions, have penalised the estimate of the atmospheric concentration figures very significantly, as is specifically indicated in **Appendix 1** (Model-based study Calmet- Calpuff, 2013).

Despite the highlighted shortcomings, and the over-penalisation of the data on emissions and chimneys, the results of the model-based application do not indicate any overrun of the various limits to protect human health that have been imposed over the years.

With regard to use of simulations as a database for the exposure of the population, the uncertainty and shortcomings in the model reported above, and in particular the fact of having ignored the contributions of other low-level sources such as road traffic, inevitably misrepresent the exposure level to be attributed to each party considered in the epidemiological study. These considerations undermine its results. If the model-based simulation was to be used as a basis for epidemiological assessments, at the very least it would have been necessary to simulate the role played by traffic, which being at a low level and concentrated near the communities, could make an important contribution to the exposure of the public.

2.2 Lichen biodiversity and bioaccumulation indicators

With regard to the second database used by the Technical Advisers, i.e. the indirect indications on air quality from the analysis of lichen biodiversity, it should be noted first, from the IBL Manual (ANPA, 2001) that "... given the substantial diversity of information it is evident that the use of biomonitors cannot be considered as an alternative to instrument monitoring ..." (Appendix 2, p. 5 of the ANPA manual "Lichen biodiversity indicator 2/2001"). It would be even more inappropriate to expect to use a generic model that records the average concentration values at each point (or even extreme values such as the 98th percentile) for a single pollutant (SO₂) from observations on lichen, without running the risk of rigorous uncertainties. Naturally, empirical models can be based on a congruent number of experimental observations, which correlate the effects on lichens to the overall concentrations of pollutants effectively recorded in the atmosphere. However, as with all empirical models this type of data, as it is not vigorously supported by a generally accepted theory and is reliant on a complex series of local parameters (lichen diversity is typically a multi-factor phenomenon) can only be useful for the site where the data used to formulate the model was recorded.

There does not appear to be any specific, validated empirical model for the site in question that documents a statistically sound, one-to-one correspondence between the degree of damage to the lichens and the concentration of SO₂ measured at the same point at the same time.

If it is a question of verifying the damage to lichens, it is less significant, as the damage may be evident in itself, but if it is a question of inferring from that damage, the condition of air quality on which to base the level of exposure for the epidemiological study, the database must be made up of measurements.

In any case, it must be stressed that the analysis of lichens (which was voluminous and extensive) as bioindicators of sulphur dioxide (over the past 3-4 years) and as bioaccumulators of vanadium (over the past 12 months) used by the Technical Adviser Scarselli in case no. 3577/01 and reused as a basis for the epidemiological study is not associated to any obvious impairment of the vascular plants or other crops, and thus to the actual "existence of damage" (Judgment in Proceedings no. 3577/01, p. 224-226).

Something that adds further serious doubt as to the reliability of the data used in the epidemiological study is the huge inconsistency between the spatial distribution of the recorded lichen biodiversity indicators and the spatial distribution of sulphur dioxide and nitrogen oxides estimated with the CALPUFF model by ARPAV (Fig.3-5 in the *Technical Report* of Scarselli, Crosignani and Magnani, 2011. Case no. 08/003946).

In this regard, Scarselli stated the following in his statement of 23/9/2013 (p. 32-33)

"... There is no, shall we say, statistically significant correspondence or correlation. This must be mentioned for the sake of accuracy ... with the model-based simulation there is an attempt to predict. It expresses, shall we say, the areas of maximum fallout and the figure is expressed in the form of the concentration of the pollutant in the soil, in the breathable air. They are therefore models that represent ... are aimed at representing the real situation, but they are purely approximations of the real situation, they are not the real situation. In no way can they substitute or supersede the results obtained from direct measurements of the soil, which should always be used as a guide in an accurate approach to evaluating the impact of a source. It is certainly not the models that should validate the data recorded in the soil, if anything it is the opposite. It is even true that by applying different models, in other words different programs, because there are dozens of them, to the same scenario, the results would not be comparable, in almost all cases. Especially when it comes to spatial fallout patterns. So the model-based simulation is important as it gives us a rough idea of the situation created inside the source, but it would be a mistake to consider those maps as completely reliable representations of the real situation ..."

Based on the above, it would clearly be a paradox to expect, merely from a mapping of lichens, to:

- establish the optimal positions of the control points,
- demonstrate the unreliability of the data from the ENEL and ARPAV measurement networks, and to some extent also the results of the ARPAV model-based simulation due to the obvious inconsistency with the lichen mapping,
- estimate the exposure to the emissions from the ENEL Plant of people who mostly live on busy roads and in towns.

All this with an empirical model obtained elsewhere, and in particular, in an environment in which overruns of air quality limits to protect human health have never been recorded, except those recurring in the whole of the Po Plain.

In conclusion, the substitute database used by the Technical Advisers to guide the epidemiological study appears to be inappropriate and intrinsically inappropriate for inferring exposures that pose a risk to health. The environment may well be one in which lichens have been damaged, but it is one in which the legal and reference limits on air quality to protect human health have always been respected.

3. The existing air quality database

3.1. Presence of macropollutants in the area

On the assumption that there are reasonable concerns for the health of the exposed population whenever there is an overrun or threatened overrun of air quality limits, the primary objective of any study is to verify compliance with those limits. With regard to macropollutants (SO₂, NO_x and particles), the body of effectively measured data that could have provided a much more appropriate reference for an epidemiological study, is temporally and spatially a broad one. The data measured in various ways by fixed and mobile stations, and which covers large portions of the area around the plant in the relevant periods, is as follows:

■ 3 ARPAV stations, Rovigo

- Pila, 1 km NNW of the plant (mobile station, in operation for limited periods);
- Polesine Camerini, 3 km OSO of the plant (mobile station in operation for limited periods);
- Porto Tolle Ca' Tiepolo, 13 km to the West of the plant;

■ 2 ARPA-ER stations

- Goro, 19 km SSW of the Plant (mobile station, in operation for limited periods);
- Mesola, 22 km WSW of the Plant (mobile station, in operation for limited periods).

■ 8 ENEL stations

- Scardovari, 7 km SSW of the Plant;
- Ca' Tiepolo, 13 km West of the Plant;
- Taglio di Po, 26 km WNW of the Plant;
- Massenzatica, 25 km W-WS of the Plant;
- Lido di Volano, 25 km SSW of the Plant;
- Case Ragazzi, 22 km WSW of the Plant;
- Ca Cappello, 20 km NW of the Plant;
- Porto Levante, 13 km NW of the Plant.
- Findings monitored by mobile laboratory between 2005 and 2009 (Rosolina, Scardovari, Porto Viro and Taglio di Po), various studies by ARPAV in the Po delta area.

As we are talking of an area with a radius of about 25 km, it would be logical to agree that this is one of the most closely monitored areas in Italy, with regard to its modest population, but this is entirely consistent with the type and size of the ENEL Plant.

Position and quality of data from the fixed stations

The positions of the ENEL and ARPAV stations have been criticised on various grounds in the reports by the Technical Advisers (Pini and Rabitti, January 2004, *Technical Report*, Cases 3577/01 and 2002/02; APAT (2005) *Environmental damage assessment*, Case no. 003577/01; Scarselli, Crosignani and Magnani (2011) *Technical Report* Case no. 08/003946), as they are allegedly positioned too far from the point of maximum fallout of pollutants from the ENEL Plant, except for the ENEL control stations at Scardovari and Ca' Tiepolo, which were considered to be in satisfactory positions. The basis for this criticism is described in the following excerpt from the advisers' report (Pini and Rabitti of January 2004 *Technical Report*, Criminal cases 3577/01 and 2002/02).

P.58

... The air quality control points outside the plant appear to be positioned too far from the plant to be able to evaluate the maximum fallout of pollutants. The main fallout from the plant seems to be concentrated in the north-westerly direction (usually peaking at around 5 km away) and in a southerly direction (peaking at around 7-8 km from the plant). Of the 8 ENEL control stations currently in operation, the only one corresponding to these positions is No. 1 (the Scardovari site) to the south. To the northwest, the only control station is No. 8 (Porto Levante) but that is almost 15 km from the plant. It should also be noted that 5 quality control stations (out of a total of 8) are more than 20 km away. The Regional Environmental Protection Agency of Veneto manages various air monitoring stations in the province of Rovigo. The only ARPAV station useful for controlling emissions from the Polesine Camerini plant is the one in Porto Tolle which is very close to ENEL control point No. 2 (Ca' Tiepolo). When considering this fact, it should also be borne in mind that the air quality control stations continuously record the effects of pollution caused not only by the Plant, but also by other sources in the area (traffic, at least) and they could therefore have been positioned at strategic points for reasons not known to the authors of this report.

It has since been found that, as mentioned by the Technical Advisers themselves in the bold text above, there are no fewer than 3 control points that can be used to monitor emissions from the ENEL Plant: Scardovari and Ca' Tiepolo (ENEL) and Porto Tolle (ARPAV).

As regards more specifically the reason behind the positioning, it must be remembered that the ENEL and ARPAV stations were positioned in accordance with the recommendations of the Permanent Control Commission, which was specifically set up and given full authority and decision-making powers in this regard (**Appendix 3** - *Commission Report*). The Commission's work is fully in line with the principle laid down in the law in force at the time (Directive 1999/30/EC and MD 60/2002), which was also reiterated in the existing law (legislative decree no. 155/2010). The law states that monitoring for the protection of health rather than ecosystems must take place in areas or "agglomerations (urban areas or groups of urban areas which are distant from each other only a few kilometres) registering the highest levels to which the population is likely to be exposed directly or indirectly for a significant period in relation to the period of mediation of the limit value(s)".

The principle is certainly to monitor those sites from which the highest fallouts are expected, but in the context of the urban agglomerations to be protected. In a context in which resources are not unlimited, it is clear that this positioning is the result of a compromise between the fallout of the pollutants and the protection of the largest groups of the population, partly because the population itself requests it.

In any case, even if the ENEL station at Scardovari (as mentioned by the Public Prosecutor's Technical Advisers several times) was the only one able to record the maximum fallout of emissions from the Plant, the records for 2001-2002 show that the values from this station are very low, and far below the current air quality limits to protect human health (**Fig. 3.1**). Almost all of the daily averages are in a range between values lower than the measurement limit and 10 µg m⁻³, only 4 values recorded early in 2002 were around 15 µg m⁻³, and they all comfortably meet the limits in force until 2002 and those in force thereafter (**Table 1.1**).

Moreover, the values from the ENEL-Scardovari station, which according to the Technical Advisers was able to record the maximum fall out, are in line – if not tending to be lower than the annual average - with the values from the other grid stations situated further from the Plant (Table 3.1). (Di Marco and Maggiore, APAT 2005, *Environmental damage assessment*, Case no. 003577/01). The fact that the presence of sulphur dioxide in the area in 2001 was of absolutely no concern is also recognised in the report by Agenda 21 Polesine (**Appendix 4** Agenda 21 Polesine, *Report on the state of the environment*. La.Terr.A. Environmental Laboratory 2003 Rovigo – Excerpt from page 16), which reads: "... As mentioned in the ARPAV report... the indicators point to levels of SO_2 that are far below the limit values indicated in Presidential Decree 203/88..." (Table for the year 2001 in the appendix).

ENEL Scardovari control station

[For the chart, please refer to the Italian version of the document]

[...omissis...]

Average daily measurements from 1 January 2001-31 December 2002

Fig. 3.1 **ENEL-Scardovari control station: Concentrations of daily averages of SO₂**. **2001-2002** (taken from p. 63 of report by Pini and Rabitti, January 2004, *Technical Report* in criminal proceedings 3577/01 and 2002/02).

It is also easy to note that the individual concentration figures from the ENEL-ARPAV network bear little correlation to the trend in electricity generated by the plant. During the years 2001-2002, the Technical Advisers gave the following reply to a specific question on the report concerning Plant emissions and air quality:

Page 64 "... It can be seen, but only visually, that there is a weak correlation with the functioning of the thermoelectric plant for the residue concentration figures recorded at the Ca' Tiepolo station ... The same correspondence cannot be found when looking at the SO₂ soil concentration data ... " (Pini and Rabitti, Technical Report January 2004, criminal proceedings 3577/01 and 2002/02).

Table 3.1 Average annual concentrations recorded by the ENEL network (taken from the ARPAT report for 2005 mentioned above)

	ENEL grid :	ENEL grid stations							
Year	Soordoveri	Ca' Tiepolo	Taglio di Po	Massenzatica	Lido di	Case	Ca'	Porto	
	Scardovari				Volano	Ragazzi	Cappello	levante	
	Average S0	Average SO ₂ concentration in the year (µg m ⁻³)							
2000	3	3	3	3	2	3	4	2	
2001	2	3	3	3 2	2	3	3	2	
2002	2	3	4	3 2	2	3	3	3	
2003	2	2	2	2		2	2	1	
2004	1	2	2	1		2	2	1	

To conclude on this issue, we can refer to the words used by the technical advisers Pini and Rabitti in that report:

Page 66 ... "It is worth remembering what has already been said and written previously. The correspondence between data on emissions and air quality data is problematic in general, given that various sources (obviously including the thermoelectric plant) can influence the data recorded at the sampling points (especially those at Porto Tolle and Ca' Tiepolo)" Furthermore,

Page 66 ... "It can be seen that the correspondence (albeit weak) recorded between the operating data and the emissions data in 2001 — 2002, in terms of soil residue concentrations could not be seen in 2003 ... " (idem)

To support the role possibly played by other sources as to the presence of SO_2 in the area, we note that the average daily concentrations of SO_2 (4÷5 μ g m⁻³) were recorded at the ARPAV station in Porto Tolle between 10 April and 31 May 2003, when the plant was "**not in operation**" **Fig.3.3** (official ARPAV data).

ARPAV station at Porto Tolle
Average daily figures: 1 January-31 October 2003

[For the chart, please refer to the Italian version of the document]

[...omissis...]

Fig. 3.3 Average daily concentrations of SO2, ARPAV station: Porto Tolle -2003

These concentrations without a doubt come from other sources, at a time of the year when the heating presumably was not switched on and when the weather conditions were not at their worst. There is no mention of this contribution – which is not exactly negligible – in any of the Technical Advisers' elaborations or findings.

It is extremely surprising that despite the voluminous documentation presented by the Technical Advisers, there is almost no mention of the reasons underlying the huge discrepancies between the distribution of the pollutants emitted by the ENEL Plant as estimated by the model, the mappings of lichen biodiversity and the mappings of vanadium bioaccumulation. The highest lichen biodiversity indicators (medium-high biodiversity, i.e. low impact of the ENEL Plant in terms of SO₂ and NO₂) do not coincide, as they should, with the minimum values for vanadium bioaccumulation (low or non-existent impact of residues from the Plant), while the visible bioaccumulation of nickel, which is inexplicably concentrated in the area of Porto Viro – a point that is certainly not significantly affected by the Plant – appears to be completely separate (**Fig. 3.7**).

[For the chart, please refer to the Italian version of the document]
[...omissis...]

Fig. 3.7 Distribution of the lichen biodiversity index (a), vanadium (b) and nickel (c)

In this regard it is also worth mentioning the condition of the area described by the Technical Advisers in 2008 (when the plant was practically shut down) in connection with the experts' report on the reconversion of the coal plant (Case no. 4163/07- Pini, Rabitti, Scarselli and Tositti, Supplementary technical report, December 2008, pages 44/79)

"... An analysis of the figures for February-May 2008 shows that the entire range does not reflect remote background conditions (i.e. biodiversity) but in both stations represents floral background conditions. In other words, the area is influenced by emissions sources that may be partially local but are mainly regional, and raised the particulate levels above what would be expected in a protected area... Even though the area appears to be protected by environmental restrictions, it is within the sphere of influence of no fewer than three highly industrialised sites including Venice Porto Marghera (where an ENEL coal plant is already in operation), Ferrara and Ravenna..."

The Technical Advisers stated the following (Scarselli, Crosignani and Magnani, 2011, *Technical report*. Case no. 08/003946), page 3.

"... The reliability of the data for some of the parameters measured by the ENEL network is **extremely doubtful**: a number of findings gathered during the lengthy legal proceedings have highlighted a problem with regard to the underestimation of SO₂ and particles, probably due to calibration defects and/or the obsolescence of the sensors installed at the control stations..."

These are serious allegations based on pure assumption, unsupported by any rigorous evidence, and they challenge the propriety not only of ENEL but also of ARPAV, which was responsible for the controls. With regard to the network managed by ENEL, officials from the provincial government and ARPAV had "webpages available to verify and validate the data" (Scarselli, 2005, Technical report, Case no. 3577/2001) and it is highly unlikely that the inspectors would have failed to notice underestimations occurring systematically at all the stations over several years. The same Technical Advisers also acknowledge that:

"... The periodic calibration of each instrument, which is required by the above-mentioned Decree of the President of the Council of Ministers, is carried out automatically. The annual accuracy and linearity checks on the instruments are carried out each quarter by personnel from ENEL laboratories and from the Rovigo branch of the Regional Environmental Protection Agency of Veneto..."

Also because "the above-mentioned Ministerial decree authorising the construction of the plant requires preventive measures to be taken in the event of critical meteorological or climatic conditions highlighted by the control network. These measures include the raising of the temperature of fumes in the chimney, the use of low-sulphur combustibles (this measure is no longer current as only very low sulphur combustibles are used) and reduction of the load ..." (page 9 Case no. 4163/07 Mod. 44, Pini, Rabitti, Scarselli, Tositti, Technical report, June 2008).

In reality, these serious allegations of unreliability of the ENEL control stations are not supported by any certain proof: there is no documented validation campaign in which accredited monitors have validated the discrepancies by using the same measurement method alongside the ENEL sensors.

It also appears that no consideration has been given to the fact that the **annual average values of SO**₂, measured with the ENEL network and at the ARPAV control stations, largely concur with the results of the ARPAV model-based simulation for 2010 (*Model-based simulation of fallout from the ENEL Plant 2000-2006, in support of the Provincial Department of Rovigo*, case no. 3946/2008) (It is well known that the most reliable data comes from simulations for the medium to long term). In the documents in case no. 3777/2001, the Technical Advisers make a specific reference, on which they base their opinion that the ENEL data is unreliable and consequently exclude that data from the database for the epidemiological study (Scarselli, Crosignani and Magnani, 2011, *Technical report*, Case no. 08/003946, page 3). The data consists of the results of short-term measurement campaigns conducted with the mobile equipment of ARPA Emilia Romagna in the municipality of Mesola. When this data is compared with the measurements by the ENEL network for the same period, they systematically show higher values (ARPA Ferrara, 2003, *Technical report on air quality tests in Mesola 2002-2003*).

Below is the text that mentions the alleged inconsistency (Scarselli, 9/10/ 2005, *Technical report*, Case no. 3577/2001)

Page 4... "While searching for historic data that would allow a comparison of measurements carried out with different instruments in the area of investigation, we found the results of a measurement campaign carried out by ARPA Emilia Romagna in Mesola in 2002 and repeated in 2003. This data, which also refers to a limited time-period [shows] differences in the measurements of SO_2 (sulphur dioxide) between the ARPA control point and the equipment used in ENEL's monitoring network for the Plant. The SO_2 data from ARPA always appears to be higher than for all the automated ENEL stations.

These differences, although seemingly marked, should not be considered significant, as the measured SO₂ concentrations were in all cases very low, always well below the levels of alert and close to the minimum threshold values. Moreover, considering that the current levels of contamination from primary gaseous pollutants remain very low in the investigation area, further verification in this regard would not be of any use. (Figures 14-16, data and elaborations by APAT Ferrara)..."

Ignoring the fact, in itself significant, that the equipment used was different, was operational in different areas and was only compared for very short periods of time, the Technical Adviser himself acknowledges that:

"... although these differences seemingly marked, they should not be considered significant, as the measured SO₂ concentrations were in all cases very low, always well below the levels of alert and close to the minimum threshold values..." (as above)".

In reality the systematic differences that were observed, which the Technical Adviser himself initially considered not to be significant but then suddenly used them as proof of an underestimation, relates to the classic problem of **instrument sensitivity**. The sensitivity of an instrument is the smallest value that can generate an appreciable signal at the start of the measurement field and which thus defines the lower limit for that field (the upper limit is represented by the full scale). Two instruments can both be valid and can both record systematically different values, but if those values are close to the sensitivity limit, the differences will have no significance whatsoever and it would be wrong to extend the diversity of measurement noted in the full scale zone to the rest of the measurement field. The conclusions drawn by ARPA Emilia Romagna, **the only party entitled to evaluate the results of the short-term measurement campaigns conducted in Mesola**, which would have provided evidence of ENEL's underestimation of the values, are as follows:

Page 38 "... the SO₂ values in the air at Mesola are comfortably below the legal limit and close to the quantification limits of the monitoring method used ... and in another point in the report" It is possible that the difference in measurements between the ARPA campaigns and the fixed ENEL records can be explained by the different placement of the test points (a mobile station positioned in an urban area, and ENEL station in the open countryside) and by the fact that they were different measurement systems ... (ARPA Ferrara, "Technical report on air quality testing in Mesola in 2002 - 2003; Supplementary expert's report, December 2008, page 38, Case no. 4163/07) (Pini, Rabitti and Scarselli 2008, Supplementary expert's report, Evaluation of ENEL's replies to the observations by the regional government of Veneto, Case no. 4163/07)

It is also interesting to note, with regard to the alleged underestimation by the ENEL stations, that from an analysis of the data of the two adjacent stations (since 2003 they have measured SO_2 , one owned by ENEL - Ca' Tiepolo and the other by ARPAV - Porte Tolle), the types of values are absolutely comparable and are also in line with the Scardovari data, which, again, in the opinion of the technical advisers is in the area of maximum fallout of emissions from the Plant (**Figures 3.2** and **3.3**).

ENEL network - 2003

[For the chart, please refer to the Italian version of the document]

[...omissis...]

Fig. 3.2 Average daily concentrations of SO₂ ENEL station at Ca' Tiepolo -2003

ARPAV station, Porto Tolle

Average daily values between 1 January-31 October 2013

[For the chart, please refer to the Italian version of the document]
[...omissis....]

Fig. 3.3 Average daily concentrations of SO₂ ARPAV station at Porto Tolle -2003

Page 25 of the statement made by Scarselli (23/9/2013) also reveals an alleged underestimation of particles by the ENEL network, compared to the ARPA measurements for 2003:

".... With regard to the particles, it has emerged quite clearly that the ENEL sensors, for example, but **probably** also for sulphur dioxide, were giving data that shall we say was far below the actual value ..."

In reality, the comparison is being made between completely different instruments, in different locations than the local sources during a period when the networks – to comply with the law – were moving from the measurement of total particulates to PM10, and the data was completely unsuitable for comparison. In any case, the Technical Adviser himself states immediately afterwards:

"... The situation in the delta that emerged from 2003 onwards with regard to particles was a critical situation that I have to say was **common to much of the Po Plain**... "

3.2. Concentrations of SO₂ and air quality limits

Having thus reiterated the validity of all the measurements made in the area, without excluding the data from the ENEL network, the question is now to evaluate the concentration levels in relation to the air quality limits in force.

First it must be said that an assessment of air quality, in the only form provided for by law - i.e. a comparison with the standard for the concentration of pollutants recorded in the atmosphere using standard protocols – is in no way borne out in the judgment in the case that identified damage to lichens. On the contrary, it was found that this type of violation was absent:

"... It must be clear that air quality is not directly relevant in these proceedings: ... There are no objections concerning violations of air-quality laws (incidentally it can be said that violations of this kind have not emerged in any case) ..." (Judgment in case no. 3577/01, Page 214).

In effect, the countless studies and measurement campaigns conducted in the area over the years (as mentioned, this is one of the most closely monitored areas in Italy) never recorded an overrun of the limits to protect human health, with the obvious exception of PM10 and ozone, which are basic problems in many areas and particularly in the Po Plain. In the specific case of SO₂, there are no reports of overruns or threatened overruns, not only in the measurement campaigns and elaborations produced for various reasons during the lengthy authorisation process and legal proceedings, but not even in the model-based simulations.

Moreover, the assessment of the Institutional Technical Group in its final report on the emissions produced by the Plant and the potential effects on the health of the population also repeated that the air quality limits to protect human health for the regulated pollutants were never overrun (**Appendix 5** - Institutional Technical Group, 2007):

• **No major effects** were found for the emissions from the Plant on the measured concentration levels of SO₂, NOx, NO₂ and PM₁₀ in Porto Tolle and in the wider domain that would be evidenced in the average, monthly or annual averages. However, for the hourly average concentrations, certain rather significant **peaks of concentration of SO**₂ were found, in an isolated period of time, in the area around the plant but below the legal limits.

For the period 2003 onwards, the Institutional Technical Group also noted:

- Over the years, the concentrations of pollutants recorded in the air at Porto Tolle were below the regulatory limits except for the number of annual overruns of the daily limit value permitted for PM₁₀ and the annual concentrations of NOx. These values were overrun in a similar way in almost all stations in the region of Veneto.
- The **annual and monthly concentrations of** PM₁₀, NOx, NO₂ and SO₂ in Porto Tolle tend to be lower than those recorded at the other adjacent stations (the province of Rovigo, Verona, Padua and Venice).

The various reports by the Technical Advisers maintained that there was a possible overrun of the limit for sensitive vegetation (10 µg m⁻³), an annual average value that is not found in Italian law, and "... *Probably also the limit for the protection of ecosystems, of 20 /µg m⁻³* " (Scarselli, March 2006, *Compliance with limits of concentrations of atmospheric pollutants established by WHO (2000) to protect sensitive vegetation and ecosystems in the Po Delta,* Case no. 3577/2001). Apart from the absence of direct measures in this regard, and leaving aside the consideration on ecosystems, Mr Scarselli merely formulated a theory. We repeat that these alleged overruns did not demonstrate any impairment of the vascular flora and therefore an actual "existence of damage" (Judgment in case no. 3577/01, pages 224-226). In conclusion, all the documentation from the institutions that either measured or simulated the condition of the air quality between 1998 and 2009 rules out the possibility of overruns of the limits for the protection of human health in force for SO₂ during the monitoring period.

The height of the emission point

The common perception of large-scale emissions from major industrial sources tends to view the situation for the surrounding area as disastrous. In reality, the level of concentration of pollutants in the soil largely depends on the height from which the pollutant is emitted. The geometrical height of the chimneystack (250 m in this case) should always be combined with the additional rise in plume height. Because of the speed at which the fumes are emitted (more than 100 km/h at full load) and the considerably higher temperature (140 $^{\circ}$ C) of the surrounding ambient air (leading to strong buoyancy), this can range from 1 to 8-10 times the geometric height of the chimney, and in the case in question, could reach heights of 400-500 to 2000 m. Broadly speaking, the mathematical models assume that the maximum soil concentration of a pollutant emitted from a specific source at altitude is diluted, on average, by a factor equal to the square of the height at which the pollutant itself is emitted.

This means that if the height of the emission point is for example 500 m (typical of the case in question) the concentration with which the pollutant emitted from the chimney reaches the soil at the point of maximum fallout is on average diluted by 250,000 times (500 x500). However, atmospheric stratification may force the plume to disperse in a layer of the atmosphere limited to a few hundred metres (mixing layer), with the effect of increasing the soil concentrations. This however is a problem typical of low-level emissions (traffic, urban heating, low chimneystacks). In the case in question, the height of the stack added to the rise always perforates the low mixing layers, which are typically at the root of many air quality problems. In cases where the plume from the plant, despite being emitted at altitude, is confined in a high mixing layer, the layer would be high enough to allow the emissions to dilute sufficiently (Fig.3.4). A statistical analysis of the meteorological data and data on the rise in plume height, produced monthly by the CALMET-CALPUFF modelling system for this case, shows that for a very large part of the year, the plume rises above the mixing layer, and on average is 300 m above it between October and March, and 150-200 m (again, above the mixing layer) from April to September. The main reason for this difference is that the mixing layer naturally has a smaller vertical extension in the autumn and winter months when there is less solar energy, which is the main influence on its thickness (Appendix 1, Model-based study, Calmet- Calpuff, 2013).

[For the chart, please refer to the Italian version of the document]
[...omissis....]

Fig. 3.4 Height of sources and dilution in the mixing layer

The effect of dilution at altitude was widely used in the 1980s and 1990s in order to identify the height of a stack that would, as mentioned, allow compliance with air quality standards for the soil in the area surrounding the plant. This type of approach, widely used in all industrialised nations, was overturned with the emergence of *cross-border pollution*, in the first place acid gases (SO₂ and NO_X), which, when emitted at high altitude are transported to a great extent by air to areas thousands of kilometres away from the emissions point. The reporting of this phenomenon by countries affected by external emissions gave rise to international organisations and protocols in which the member states, based on model-based estimations that evaluated the import/export balance of pollutants of each country, agreed to reduce their share of the emissions.

In conclusion, it is not surprising at all that despite the large emissions such as the ones from the Plant under consideration, the air quality limits to protect human health and vegetation in the surrounding area, have been met. This is for two reasons:

- 1. The height of the Plant's chimney (250 m) and the additional average rise in plume height take the emission point to high altitudes, spreading the pollutant over a large spatial area resulting in a significant reduction in soil concentrations, particularly close to the Plant.
- 2. The models used to estimate the distribution of the pollutant, once emitted into the atmosphere, indicate that for hot emissions at altitude only a small part impacts the surrounding area. The rest at low concentrations, instead, affects locations that may be thousands of kilometres away (this leads to the problem of cross-border pollution mentioned above, of which SO₂ has been the main component, and the resulting international control protocols).

3.3.1 Monitoring of micro-pollutants: Vanadium

3.3.1. Air quality

The WHO 2000 *Air quality Guidelines for Europe II Ed., Chapter VI* indicate a reference value of **1** µg m⁻³ (1000 ng m⁻³) as an average for 24 hours, below which there is no adverse effect on the health of exposed individuals. The concentrations of vanadium in rural areas vary between a few nanograms to several dozen nanograms per cubic metre, in urban areas from 50 ng m⁻³ up to 2000 ng m⁻³, with the highest values in large cities during the winter (*WHO, 2000, Air quality Guidelines for Europe II Ed., Chap.VI*).

Atmospheric concentrations

First, it must be mentioned that vanadium is one of the most plentiful elements on the Earth. It is found, for example, in phosphate fertilisers, which are made from natural phosphates and are widely used in farming.

The measurements of atmospheric concentrations in the area are few and spread apart. The results of the monitoring campaign carried out by ARPA-Rovigo in 2003-2004 are shown in **Fig. 3.5** (Fig. 9 of *Replies to Public Prosecutor's questions by* Scarselli 09/10/2005, filed on 14/10/2005, Case no. 3577/2001).

CONCENTRATION OF VANADIUM IN PM10

[For the chart, please refer to the Italian version of the document]

[...omissis....]

Figure 3.5 Measurements of vanadium recorded by ARPA-Rovigo. 2003-2004 (from Fig. 12 of Mr. Scarselli's reply (09/10/2005) to the question by the Public Prosecutor, Case no. 3577/01, filed on 14/10/2005).

The values are, on average, 200 times lower than the WHO limit mentioned above, which as also mentioned above, is typical of rural areas. All the measurements recorded concentrations that were widely below the reference standard. In particular, it can be seen that:

1) The values are approximately 200 times lower than the WHO standard of 1000 ng m⁻³ and they are also lower than the values from databases in Europe and the USA, used by the WHO to draw up the guidelines (Lahmann, E. et al. *Heavy metals: identification of air quality and environmental problems in the European Community.* Luxembourg, Commission of the European Communities, 1986, Vol. 1 & 2 (Report No. EUR 10678 EN/I and EUR 10678 EN/II).

- 2) The results of other measurement campaigns conducted in Mesola 2002÷2003 (ARPAV) and in Goro 2003 (ARPA-ER) are within the same range (documents in case no. 3577/01, see appendix on sheet 3377).
- 3) The V/Ni ratios measured at the various stations **are never constant**, as they should be if they came from a particular emission from a single source. In fact, they vary at broad intervals and the values are sometimes very different from those corresponding to the emissions from the ENEL Plant, which means that the emissions from the Plant, which have a relatively constant Ni/V ratio, are not the only decisive factors in the environmental presence of this element.
- 4) The concentrations of vanadium appear to be rather variable within the area, and are essentially independent of the distance from the Plant, as if to indicate a widespread presence that is not determined by a single point of emission.
- 5) The correlation of ARPAV data with the PM10 and particularly with the hours in which the Plant is operational is substantially non-existent, as acknowledged by the Technical Adviser himself (Scarselli, 2005, *Replies to questions by the Public Prosecutor, Case no.* 3577/2001, page 3), which is further proof of the marginal role of the Plant:
- 4) The heavy metals measured in the PM10 in 2004 have limited concentrations in line with expectations, in areas that are not particularly polluted. The fluctuations over time are fairly marked to certain elements but they are never strictly correlated with the concentrations of PM10 nor with the operation of the Plant. Of all the metals, the one whose trend is most comparable with the operation of the Plant appears to be vanadium, which at the Pila station demonstrated an obvious concentration in October, at the peak of the Plant's operation (Figures 9-12)

With regard to the observation in the mentioned text "... vanadium... appears to be the metal whose trend can be compared with the Plant's activity", there is no systematic reference to this in Fig. 3.6, on which that observation is based. The event of October is not represented in any other case and the trend in the recorded elements, as mentioned by the Technical Adviser himself, shows "... Fluctuations over time, which are never closely correlated with the concentration of PM10 nor with the operation of the plant "(Scarselli, idem).

VANADIUM IN PM10 COMPARED TO HOURS OF OPERATION OF THE PLANT IN 2004

[For the chart, please refer to the Italian version of the document]

[...omissis...]

Fig. 3.6 Concentrations of vanadium in PM10 in relation to the hours of operation of the Plant

A detailed study carried out on behalf of the Public Prosecutor's Office in 2008 reiterates the absence of any statistically acceptable correlation between the presence of vanadium in the atmosphere and the activity at the Plant. In 2008, the Plant was already essentially inactive – data was obtained from the Ca' Mello station, which is not only **indistinguishable from the data for the ARPAV** campaigns of 2003, but is completely in line with the commonly accepted "rural background" values (**Appendix 6** - page 19 in L. Tositti, *Evaluation of air quality in the Po delta, stations of Ca' Mello and Boscone della Mesola in current environmental conditions – 18 March 2009*).

Soil deposits

Another approach used to describe the presence of pollutants in particle form within the area is to use deposimeters to collect materials deposited in the soil, both during dry deposition (regulated by atmospheric turbulence) and wet deposition (regulated by rainfall).

In August, September and October 2003, measurement campaigns conducted by the Environmental Studies Centre (CSA) on behalf of the Public Prosecutor's Office detected a series of heavy metals collected from the soil using deposimeters (CSA, 2004, *Final Report, Technical Advice in Case No.* 3577/01) (Scarselli 2005, *Replies to Public Prosecutor's questions, Case no.* 3577/2001).

The study showed that there were deposits of vanadium, nickel but also zinc, lead and copper, among the elements of interest (**Table 3.2**).

It absolutely goes without saying that on a site on which a large oil-fired electrical plant is in operation, there may be contributions of nickel and vanadium to the atmospheric concentrations and soil deposits, compared to other sites located far from power plants. It is now a question of interpreting the significance of the recorded data, and of assessing its compatibility with the environment, comparing it with standards and other references that indicate acceptable risk levels compared to the benefits of energy production. Rather than referring to air quality standards and other types of references, the cited study (CSA, 2004, Final Report, Technical advice in case no. 3577/01) compares the deposit data with the data recorded monthly in 1998-99 (4-5 years earlier) at four sites in the Venice lagoon, by the 4 monitoring stations in the 2023 Orizzonte Project (conducted by Consorzio Venezia Nuova on behalf of the Venice Water Authority), and it concluded that there were higher deposits of nickel and vanadium in the area around the plant. The sampling periods were not the same, and there is no doubt that the meteorological conditions at the time of the samples were not the same. This makes the comparison extremely uncertain. However, if we look at the data in Table 3.2 in detail, it must be noted that the nickel deposits in the Plant area are entirely similar to the deposits found in the Lagoon, while for vanadium there are only two episodes that differ from the values recorded in the Lagoon. In compensation, the Venice Lagoon has higher levels of zinc, cadmium and copper.

Table 3.2 Daily flows of trace elements found in the Plant area compared to flows recorded in the Venice Lagoon area

Table 2 Daily flows (μ g m⁻² d⁻¹) of atmospheric deposition of metals during the study period. The deposition data for inorganic micropollutants recorded in 1998-99 in the Venice Lagoon by the four monitoring stations as part of the 2023 *Orizzonte* project (Consorzio Venezia Nuova on behalf of the Venice Water Authority, 2000, Contribution of atmospheric fallout to lagoon immissions – 2023 Project. Activity A. 2023 - A - REL- T010.0) has been provided for the purposes of comparison. Data highlighted in grey. * = Accurate volume in relation to the exact quantity of rain recorded by the ARPAV pluviometer, positioned next to deposimeter no. 3.

CSA	station	km	from	to	days	rainfall	Al	٧	Cr	NI	Cu	Zn	As	Cd	Hg	Pb	Fe
code		from				(mm)											
		ENEL															
17100	Site 1 -	12,2	05-Aug-03	03-Sep-03	29	7.6	20842	7.4	6.4	5.8	11.2	33.7	0.56	0.08	0.008	26.2	1226
	Ca'Tiepolo		10:30	9:30													
17101	Site 2 -	1,2	05-Aug-03	03-Sep-03	29	1.6	2720	13.8	8.4	10.3	9.6	32.9	0.59	0.20	0.019	5.6	1686
	Pila		11:50	10:05													
17102	Site 3 -	10,1	05-Aug-03	03-Sep-03	29	5.8	1921	5.8	5.5	5.2	18.0	36.8	0.52	0.07	0.021	5.4	1174
	Ca'Mello		13:10	10:55													
17103	Site 4 -	4.2	05-Aug-03	03-Sep-03	29	1.7	1776	6.4	4.8	5.4	6.2	18.9	0.41	0.04	0.014	8.4	939
	Polesine		16:30	11:20													
	Camerini																
20781	Site 1 -	12,2	03-Sep-03	02-Oct-03	29	122.8	448	9.0	1.6	2.4	11.9	45.3	0.65	0.29	<0.003	28.5	350
	Ca'Tiepolo		9:30	9:10													
20782	Site 2 -	1,2	03-Sep-03	02-Oct-03	29	178.8*	1073	29.2	4.1	6.8	4.9	30.5	0.79	0.18	<0.003	11.2	704
	Pila		10:05	10:00													
20783	Site 3 -	10.1	03-Sep-03	02-Oct-03	29	178.8*	649	7.7	2.2	2.1	13.4	125.7	0.52	0.14	<0.003	13.1	438
	Ca'Mello		10:55	11:30													
20784	Site 4 -	4,2	03-Sep-03	02-Oct-03	29	129.3	718	16.9	2.8	5.7	7.1	31.1	0.65	0.20	<0.003	50.3	607
	Polesine		11:20	12:15													
	Camerini																

20786	Site 1 -	12,2	02-Oct-03	24-Oct-03	22	30.0	1435	5.8	4.3	4.9	7.3	26.8	0.52	0.10	<0.003	13.3	829
	Ca'Tiepolo		9:10	9:30													
20786	Site 2 -	1,2	02-Oct-03	24-Oct-03	22	36.6	971	35.2	5.3	18.4	5.6	28.1	0.40	0.12	<0.003	5.3	594
	Pila		10:00	10.30													
20787	Site 3 -	10,1	02-Oct-03	24-Oct-03	22	31.8	2651	7.7	7.8	7.6	11.1	228.7	0.84	0.09	0.004	8.8	1588
	Ca'Mello		11:30	11:05													
20788	Site 4 -	4.2	02-Oct-03	24-Oct-03	22	36.1	621	6.4	1.7	3.7	4.4	22.5	0.34	0.08	<0.003	7.2	331
	Polesine		12:15	11:45													
	camerini																

Venice Lagoon	min	164	1.6	0.4	1.4	4.4	9.5	0.19	0.04	0.01	0.04	85.2
7 0100 <u>L</u> ugoo	max	4465	15.9	8.0	14.3	47.5	354.5	2.28	6.26	0.29	6.26	1841.4

The fact that in the plant area there are higher deposits of vanadium than those found in the Venice Lagoon is not only not a reference standard, but means very little unless excess values of such a presence are recorded in the air and soil, the main routes through which the pollutant reaches the exposed individuals.

In any case, the contents of the "Summary of the results of the environmental monitoring campaign around the ENEL Plant at Porto Tolle, June 2003-September 2004" by Scarselli and Magnani Page 3, Case no. 3577/2001 can be used to provide a brief final evaluation of the countless analyses of trace elements carried out in the area. In that summary, the Technical Advisers, while considering that the data for nickel and vanadium "must not be underestimated", admit that "the data for nickel and vanadium are not of a level that would cause alarm or serious concerns with regard to the current and recent effects on health and on the environment".

The Technical Advisers then provide, as is entirely correct, evaluations of the quality of the soil, vegetable crops and water. The conclusions of those evaluations are given below (*Monitoring of atmospheric contamination around the Porto Tolle plant by Scarselli and Magnani*, December 2003, Technical Report no.1, *Case no. 3577/2001*).

3.3.2 Soil quality

The scope of the deposit of stable pollutants such as Ni and V naturally is also reflected in its presence in the soil. The above-mentioned study from 2003 evaluated the contamination of soil around the Plant by using 21 measurement points within a 22 km radius from the plant. The conclusions are as follows (page 3 "Summary of the results of the environmental monitoring campaign around the ENEL Plant at Porto Tolle, June 2003-September 2004" by Scarselli and Magnani Page 3, Case no. 3577/2001)

"... The purpose of the soil sampling is to obtain quali-quantitative indicative data about the possible secondary contamination linked to atmospheric emissions from the Plant. For this reason, the soil chosen was as "undisturbed" as possible (permanent meadows), most of it was on private land and in any case was far from obvious "pointed" sources of potential contamination... With regard to the soil (permanent meadows), there were no appreciable phenomena of secondary contamination (bold inserted by author) while all the soil samples, which were very different in terms of chemical composition and physical characteristics, presented the typical characteristics of undisturbed land. The measurements of radioactivity (137 Cs) were also reassuring, as all the samples were within the expected range according to the recorded data for the Veneto plain..."

It is rather surprising that the report does not give adequate weight to this result, which is highly significant. This because the land not only gives a history of the persistent and cumulable pollutants emitted over a long period of time, but is also a major route through which humans are exposed either directly by ingestion or skin contact, (especially in the case of children) or indirectly through the food chain.

Quality of vegetable crops

Edible plant crops can channel toxic metals through their leaves, storing them internally and in the root system. The report (*Determination of heavy metals in vegetable crops around the Porto Tolle plant* by Scarselli and Magnani, Report no. 3 of September 2004, page 7, Case no. 3577/2001) drew the following conclusion:

"... The analysis of vegetable crops did not highlight any appreciable interference attributable to emissions from the Plant with regard to the content of heavy metals in the tested vegetables (bold inserted by author)... Some enrichments higher than those typical of uncontaminated vegetables, but not such that would arouse concern, of Cd and to a lesser extent As, Ni and Cr, could realistically be interpreted as short-distance contamination stemming from local agricultural practices (Cd) and from the terrigenous presence in the tested material (As, Ni, Cr)..."

3.3.3 Water quality

With regard to the aqueous environment, again in the "Summary of results from the environmental monitoring campaign around the Porto Tolle plant, June 2003 - September 2004" by Scarselli and Magnani, page 3, Case no. 3577/2001, page 4, the following conclusion was reached "... Tests of samples of surface water indicate an acceptable standard of quality ...

... Tests of the water entering and leaving the Plant indicate that all the tested parameters fully complied with the legal standards ..."

3.3.4 Accumulation in lichens

Also with regard to this aspect, the following conclusion was reached in the "Summary of results of the environmental monitoring campaign around the Porto Tolle plant, June 2003-September 2004" by Scarselli and Magnani Page 3, Case no. 3577/2001, page 2 "... The elements Al, Fe, Hg, Cu, Pb, As and Cr are present in the concentrations typical of natural or near-natural areas, and no station highlighted any secondary contamination of any significance. Three sites highlighted moderate to average alterations of Cd and Zn, which can be explained by intensive farming practices. Also for As, Hg and Cu apart from the natural influence of the soil, there are possible correlations with the use of pesticides and chemical fertilisers. Vanadium and nickel are those with the highest concentrations and some of the sites show significant deviations from the basic values...".

The results of the analysis are shown in tables and maps, which interpolate the concentration values found at the 21 measurement points.

The concentration values (maximums and averages in **Table 3.3**) have been compared with similar data recorded in Veneto and in Friuli.

Tab 3.3 Comparison of maximum and average concentrations in the body of lichens

	Al	As	Cd	Cr	Cu	Fe	Hg	Ni	Pb	V	Zn
Venice	1392	3.73	1.15	5.1	47	1545	0.24	3.98	8.26	3.37	125
Belluno	599	1.67	1.14	2.02	10.1	629	0.22	2.01	10.3	0.87	41
Padua	1421	2.42	0.58	4.98	12	1814	0.22	3.83	14.4	3.41	164
Rovigo	1474	1.86	0.53	5.88	14.9	1620	0.22	5.80	5.42	5.82	99
Verona	1576	1.88	0.44	7.94	902	1477	0.31	5.41	11.3	1.78	54
Vicenza	1576	2.4	0.82	10.2	25.5	1394	0.43	6.20	12.6	4.47	88
Treviso	2714	-	0.69	8.53	40	2272	0.33	6.17	48.3	-	55.8
Pordenone	1319	-	2.55	9.59	124.5	1112	0.27	10.85	-	-	52.2
F.V.G.	1540	0.84	2.26	60.45	95.3	4276	0.28	34.37	85.62	4.72	115
Po Delta	705	0.30	0.96	3.0	7.40	816	0.15	6.70	5.90	4.80	59.6

Table 7.2.7. - Comparisons between the maximum values (ppm) of certain metals measured in clumps of Xanthoria parietina tested in various parts of north-east Italy

	Al	As	Cd	Cr	Cu	Fe	Hg	Ni	Pb V	Zn
Venice	587	1.63	0.34	2.31	13.21	625	0.15	1.86	4.75 1.63	38
Belluno	398	0.97	0.31	1.44	7.29	411	0.15	1.50	4.88 0.38	26
Padua	665	1.22	0.27	2.32	8.34	687	0.13	2.04	3.64 1.54	36
Rovigo	950	0.96	0.25	3.49	9.04	1008	0.16	2.69	2.45 1.67	42
Verona	642	0.72	0.27	2.51	6.39	641	0.17	1.79	4.66 1.10	34
Vicenza	752	0.87	0.25	3.25	10.01	706	0.15	2.35	6.11 1.57	36
Treviso	902	-	0.32	1.87	10.2	612	0.10	2.51	16.1 -	35.3
Pordenone	331	-	0.53	3.14	9.4	361	0.08	3.02		28.1
F.V.G.	609	0.21	0.46	4.46	10.48	503	0.09	2.16	9.76 1.27	36
Po Delta	439	0.11	0.25	1.63	4.77	432	0.09	2.88	2.24 2.16	34

Table 7.2.8. – Comparisons between the average values (ppm) of certain metals measured in clumps of Xanthoria parietina tested in various parts of north-east Italy.

It does not appear that the compared data has been normalised to reflect the potential for terrigenous contamination from the various soils. In any case, though, it can be seen that the absolute maximum value of nickel in the Delta is completely in line with the value for the other areas, with Friuli having a value of about six times higher. The absolute maximum for vanadium is found in Rovigo while the value for the Plain is completely in line with the values for Friuli and Vicenza.

With regard to the average concentration values, the maximum for nickel is recorded in Pordenone, for vanadium in the Po Plain: 2.16 ppm, which compares to the 1.67 ppm in Rovigo, with all the statistical uncertainty that derives from the low number of available figures and the non-normalisation with regard to soil enrichment.

This picture as outlined above certainly does not indicate a situation in the Plain that is very different from the one in other parts of Veneto, particularly if one considers that the comparison was made between sites that are non-homogenous in terms of human presence and terrigenous contamination from the soil.

Finally, with regard to the distribution within the area of the concentrations of the tested elements (Fig. 3.7), it is not possible to understand how, from the action of a sole source as assumed by the technical advisers, the reduction in the lichen biodiversity index does not coincide with the bioaccumulation of vanadium and nickel or with the distribution of the fallout of residues and gases around the plant as described by the models.

There is also no plausible explanation for the visible bioaccumulation of nickel around Porto Viro, but not of vanadium, and in particular the fact that this takes place in an area that is far from the fallout of emissions from the Plant.

In conclusion, the contribution of vanadium to the tested environmental sectors appears to be modest and has certainly never overrun the reference limits in terms of the quality of air and soil, which are the main routes impacting the exposed populations, nor are there any significant traces on the edible crops (vegetables) and in water. Ultimately the key role suggested in the formulation of the database for the epidemiological study appears to be hard to support.

[For the chart, please refer to the Italian version of the document]

[..omissis...]

Fig 3.7 Distribution of the lichen biodiversity index (a), vanadium (b) and nickel (c)

4. Trend in air quality over the years

Between 2003-2009, and in particular after 2005, the Plant saw a major reduction in activity in terms of the kWh produced, hours of operation and consumption of combustibles, leading to a reduction in the emissions of all pollutants (**Table 4.1**).

Tab.4.1 Effective activity of the Plant (ENEL data)

TOTAL	TOTAL FOR PLANT										
Year	Energy produced	Energy production capacity	Actual use compared to potential								
	kWh	kWh	%								
2005	1,692,119,200	23,126,400,000	7.3								
2006	2,114,840,800	23,126,400,000	9.1								
2007	459,346,800	23,126,400,000	2.0								
2008	267,204,800	23,189,760,000	1.2								
2009	79,368,400	23,126,400,000	0.3								
2010	0	23,126,400,000	0								
2011	0	23,126,400,000	0								
2012	0	23,189,760,000	0								

With regard to the impact of this type of evolution in the Plant's emissions on the quality of the air in the surrounding environment, rather than exhibiting masses of data it would be more sensible to hear the opinion of the authorities who recorded and interpreted that data.

For the period 2003-2007, ARPAV expressed an unequivocal opinion in the "Final report of the working group on emissions from the thermoelectric plant at Polesine Camerini and the possible effect on the public health" (Appendix 5 – Institutional Technical Group 2007),

[&]quot;.....ARPAV reports that it did not record any major effects from the emissions of the Plant on the measured concentrations of SO_2 , NO_x , NO_2 and PM10 in Porto Tolle and in the wider domain that would highlight any anomalies in the daily, monthly or annual averages. It was not possible, though, to rule out that in certain meteorological/climatic or plant conditions, there could be rather significant, albeit isolated, peaks in the concentration of SO_2 . In the area around the Plant, those same pollutants were in any case, at the time the measurements were taken, below the limits. In particular:

⁻ during the 2003-2007 period, the annual average concentrations of PM10 and NOx recorded at the station of Porto Tolle were lower than those recorded at the other stations in the province of Rovigo;

⁻ there is no significant relationship between the average daily concentrations of airborne pollutants in the soil and the number of active thermal units at the Plant both in the province of Rovigo and in the wider area..."

It should be highlighted that the Working Group represented all the higher authorities, as its members included the Director of the Regional Environmental Epidemiology Centre (CTREA), a Director from the Regional Health Department, a Director of the Public Healthcare and Screening Service (Health Department), the Director of ARPAV's Technical Scientific Area, the Director of the Regional Centre for Coordination of the Regional Epidemiological System (CRRC-SER), the Director of the No. 19 Adria Local Health Department, the Director of the No. 18 Rovigo Local Health Department, and the Scientific Director of the Cancer Register of Veneto (c/o Veneto Oncology Institute (IOV).

In another study carried out by ARPAV in collaboration with the provincial departments of Rovigo and Padua "The ENEL thermoelectric plant at Polesine Camerini – Report on atmospheric emissions tests, 2008 (**Appendix 7** - ARPA Departments of Rovigo and Padua) the following opinion was given on the condition of air quality in the zone, during the 2003-2008 period.

- "... Over the years the concentrations of pollutants recorded in the air at Porto Tolle, **have been lower than the regulatory limits**, with the exception of the number of overruns of the daily permitted limit value for PM10 and the annual concentrations of NOx. **These parameters were also overrun at almost all the stations in the region of Veneto.**
- The annual and monthly average concentrations of PM10, NOx, NO2 and SO₂ in Porto Tolle tend to be lower than those recorded at the other adjacent stations (the province of Rovigo, Verona, Padua and Venice).
- The monthly average concentrations of the various pollutants display **similar trends** for all the monitoring stations close to the Plant, and in a broader domain. No significant anomalies were recorded.
- The anemological system at Porto Tolle is affected by its proximity to the sea, with the winds tending to be more intense than those on the eastern plain, thus encouraging the dispersion of fumes from the plant over a long distance.
- No major effects were found from the emissions at the Plant on the measured concentrations of SO_2 , NO_x , NO_2 and PM10 in Porto Tolle or in the wider domain that would be highlighted in the daily, monthly or annual averages. On the other hand for the hourly average concentrations, there were several rather significant peaks (isolated over time) in the concentration of SO_2 in the area around the plant, and below the legal limits".

The assessments of air quality in the above reports for the years in question, 2005-2009, are based on the ongoing monitoring carried out in the area by the ARPAV and ENEL networks (*BRACE* and SIA ENEL national databases). The figures indicate that the residual activity at the plant is entirely irrelevant, with the presence of all pollutants being in line with the typical concentrations in the whole area, even after the definitive cessation of activity at the Plant.

It is worth stressing that the noted values of PM10, NO₂ and ozone (as the ARPAV Report notes) are common to the whole of the Po Plain, in which the important secondary component of these pollutants (i.e. the ability to form from precursor polluting gases even in areas far from the emissions point) combines with high atmospheric stability, also supported by the mountainous terrain and the shallowness of the Adriatic Sea.

There were so few concerns about SO₂ that back in 2006 ARPAV, in its *Regional Report on Air Quality for 2005* (**APPENDIX 8**, ARPAV, *Regional Report on Air Quality for 2006*), reported that:

Page 8... "For sulphur dioxide (SO_2) there were no overruns of the alarm threshold of $500 \,\mu g/m^3$, nor any overruns of the hourly limit value $(350 \,\mu g/m^3)$ nor any overruns of the daily limit value $(125 \,\mu g/m^3)$. As already highlighted in the analysis conducted as part of the Regional Plan for the Protection and Restoration of the Atmosphere sulphur dioxide is a non-critical primary pollutant ..."

Also, on page 8 "Considering the recorded levels of SO_2 and CO and taking into account the contents of Article 6 of legislative decree no. 351/99, the number of sampling points for both these pollutants can gradually be reduced" (ARPAV, 2006, Regional report on air quality – Reference year 2005)".

In 2007, a mobile ARPAV station monitored the Porto Viro site as part of the Regional Plan for the Protection and Restoration of the Atmosphere, and gave the following opinion on the results of the measurements (page 11).

"... In no cases were there any overruns of the limit values for acute exposures of $500 \,\mu \, g/m^3$ (alarm threshold), $350 \,\mu \, g/m^3$ (hourly limit value) and $125 \,\mu \, g/m^3$ (daily limit value) stipulated by the laws in force (see Tables a) and b). **The trends were similar to those recorded at station in Porto Tolle..."**.

(ARPA Department of Rovigo, *Monitoring of air quality at the mobile station in Porto Viro, Via Nello Fregnan*, 2007) (**Appendix 9** - ARPAV Porto Viro).

It is also worth mentioning the condition of the area described by the Technical Advisers in 2008 in connection with the coal plant proposal (Case no. 4163/07- Pini, Rabitti, Scarselli and Tositti *Supplementary technical report, December 2008*, pages 44/79).

"... The analysis of data for February-May 2008 shows that the whole of the Delta does not reflect remote background conditions (i.e. biodiversity) but at both stations, it represents rural background conditions. In other words, the zone is influenced by emissions sources that may be local but are mainly regional, which raised the particles to levels above what would be expected in a protected area... Although the area is protected by environmental restrictions, it is within the sphere of influence of no fewer than three highly industrialised sites including Venice Porto Marghera (where an ENEL coal plant is already in operation), Ferrara and Ravenna..."

Here it was found that the zone is within the sphere of influence not only of local sources, but of three highly industrialised sites, which could also have made their contribution in the past.

More generally, as the following tables show, both the data recorded by the ENEL network (**Table 4.2**) and by the ARPAV network (**Table 4.3**) in relation to SO₂, recorded values that were always very low during the 2005-2008 period, without delineating any clear trend.

Table 4.2 Average annual concentrations of SO₂ (ENEL network)

Table 4.2.1.17 - RRQA Enel – SO₂ - average concentration on an annual basis

SO ₂ – Average concentration in µg/m ³	2005	2006	2007	2008	2009	2010	2011
P1 - Scardovari	1.3	1.0	1.0	0.8	0.7	0.8	0.9
P2 – Ca' Tiepolo	1.4	1.2	0.8	0.7	0.8	0.9	1.0
P3 - Taglio di Po	1.6	1.4	1.2	1.1	1.2	1.1	1.1
P4 - Massenzatica	1.6	1.4	0.9	0.9	0.8	0.8	0.8
P5 - Lido di Volano	0.8	0.4	0.6	0.3	0.3	1.0	0.5
P6 - Case Ragazzi	1.2	1.3	0.9	0.9	0.9	0.9	1.2
P7 – Ca'Cappello	2.0	1.8	1.4	1.2	1.2	1.2	1.1
P8 - Porto Levante	0.8	1.1	1.0	0.8	0.9	0.8	0.8

Table 4.3 Average annual concentrations of SO₂ (ARPAV network)

Table 1.2.1.18 - RRQA - SO₂ - Average concentration on an annual basis (BRACE Database)

SO_2 – Average concentration in μ g/m ³	2005	2006	2007	2008	2009	2010
ADRIA	not	not	5.4	1.9	1.4	1.4
	available	available				
PORTO TOLLE	not	not	1.3	0.4	0.7	0.7
	available	available				
RO - Borsea	not	not	2.0	1.7	2.2	1.3
	available	available				
RO - Centro	4.8	3.2	2.0	1.8	1.6	1.1

In conclusion, all the measurement campaigns that used fixed or mobile equipment to record the quality of air between 2005 and 2009 (the year in which the plant finally ceased operation) confirm the condition of an agricultural zone, with a series of local sources coming from civil and industrial zones, and traffic.

No appreciable role can be attributed to the residual emissions from the Plant and in fact, from the time of the 2005 records, ARPAV considered that

"... Considering the levels of SO₂ and CO and taking into account the contents of Article 6 of legislative decree no. 351/99, the number of sampling points for both these pollutants can gradually be reduced ... (ARPAV, 2006, Regional report on air quality – Reference year: 2005)".

The recorded values of PM10 and PM2.5 as mentioned by the Technical Advisers themselves are fully in line with those in similar parts of the Po Plain, and form part of the problem of a wider area in which the high pressure of emissions is associated with particularly unfavourable climate conditions.

5. Conclusions

1) Database for the epidemiological study

The technical advisers' experts oriented and based the epidemiological study not on data directly connected to human exposure (concentration in the ambient air, soil, water and food) but on substitute data. That data being a) lichen biodiversity and the bioaccumulation of vanadium, from which they inferred, respectively, the atmospheric concentrations of SO₂ and of vanadium, and b) the results of mathematical models that estimate soil concentrations associated only to emissions from the plant. Both these approaches involve aspects that are wide open to criticism, which render the results of the evaluations uncertain.

The reasons that would justify the use of substitute data (poor positioning of all the control stations including those of ARPAV, and the alleged systematic underestimation by the ENEL stations), are based on assumptions that have never been demonstrated, particularly for this last aspect.

The database used by the technical advisers thus appears to be inappropriate and is intrinsically poorly suited to inferring exposures to unacceptable risks of damage to health particularly in the context of legal compliance with the limits on air and soil quality in all the Plant's emission conditions.

2) The presence of macro pollutants in the area (SO₂ and NO_x)

The countless studies and measurement campaigns conducted between 1998 and 2009 in the area (certainly one of the most closely monitored in Italy) never indicated any overrunning of the limit values to protect human health, with the obvious exception of PM10 and NO_2 in winter and ozone in the summer. The latter being persistent problems in many areas and particularly in the Po Plain as a whole. In the specific case of SO_2 , there were no reports of overruns or threatened overruns in all the various measurement campaigns or in the model-based simulations.

This is also supported broadly by a serious of evaluations conducted by institutional bodies, for example:

- a) in the judgment in the case on lichen damage "... it must be clear that air quality is not directly relevant in this case: there are no complaints of violations of the related laws (incidentally it can be said that this type of violation has not emerged in any case)... " (Judgment in case no. 357701, Page 214).
- b) in the opinion no. 52 of 26.5.2003 by the VIA Commission of the regional government of Veneto "... the risk to the health of the population living near the Plant as a result of micropollutant emissions [...] is non-existent, taking into account the dispersion values provided by the simulation model with the risk assessment references supplied by US EPA...".

3) The presence of micro-pollutants in the area (nickel and vanadium)

The contribution of vanadium and nickel to the tested environmental sectors appears to be modest and is certainly not such that would overrun the reference limits on air quality. With regard to the other environmental sectors, which for the persistent cumulable species are the main sources of impact for the exposed populations, the Technical Advisers have expressed the following opinion (reference already given in Chapter 3:

"... No appreciable phenomena of secondary contamination can be found in the soil ... The analysis of the vegetable crops did not highlight any interference attributable to emissions from the Plant with regard to the content of heavy metals ... The analysis of surface water showed an acceptable standard of quality ..."

With regard to the presence of vanadium in the lichens and the action of SO₂, even admitting that biodiversity had been reduced in certain zones, firstly this did not lead to any damage at all to the vascular plants. In the case of vanadium especially, instead, there was no evidence whatsoever in the sources of impact (air, soil, vegetable crops, water) through which the contaminant could reach an exposed individual at a dose that would be harmful to health.

Nor can it be ignored that records from 2008 reported atmospheric concentrations of vanadium that were entirely indistinguishable from the values recorded in 2003 and 2004, characteristic of the "rural background".

In summary, the body of environmental data used in the epidemiological study is made up of:

- model-based simulations with clear overestimations of the concentrations of SO₂,
- extremely condensed data on SO₂ deduced from lichen biodiversity, with an empirical model that was formulated for a completely different site and completely different environmental conditions,
- a presence of vanadium in lichens that has no reflection whatsoever on the actual presence in the environmental sectors (air, soil and water), which appear to be completely in line with the characteristic values of the rural background, regardless of whether or not the Plant was in operation.

In addition, the periods of exposure of the individuals considered in the epidemiological study refer only to the emissions from the Plant and totally ignore the role of traffic, which certainly undermines its meaning.

All this creates unacceptable uncertainties for all the subsequent evaluations, and significantly compromises their reliability. Conversely,, all the objective available data (measurements of pollutants taken for various reasons in all environmental sectors, and model-based estimations of the most serious situations) do not indicate any overrunning of regulatory limits or reference values to protect health and the environment.

Prof. Michele Giugliano

APPENDICES

APPENDIX 1- (Model-based study, Calpuff-Calmet, 2013)

APPENDIX 2- Excerpt from page 5 of the ANPA manual "Lichen biodiversity index" (2001)

APPENDIX 3- Reports by the Permanent Technical Committee for the creation of an Air Quality Monitoring Network (1973)

APPENDIX 4- Excerpt from page 16 Agenda 21 Polesine, *Report on the state of the Environment.* La.Terr.A., *2003 Rovigo*)

APPENDIX 5- Institutional Technical Group, *Final Report,* General Department of Health of Veneto, 2007

APPENDIX 6- Excerpt from page 19 L. Tositti, Evaluation of air quality in the Po Delta: stations of Ca ' Mello and Boscone della Mesola in the current environmental conditions -18 March 2009

APPENDIX 7- ARPA Departments of Rovigo and Padua "ENEL thermoelectric plant of Polesine Camerini – Report on findings related to atmospheric emissions, 2008"

APPENDIX 8- Excerpt from page 8 ARPAV, *Regional Report on Air Quality 2006 – Reference year 2005*

APPENDIX 9- ARPAV, Monitoring of air quality by mobile station - Porto Viro, 2011)



G. R. of Crimes No. Gen. Reg. No. JUDGEM. No.

COURT OF ROVIGO

OPERATIVE PART OF THE JUDGMENT ITALIAN REPUBLIC IN THE NAME OF THE ITALIAN PEOPLE

The Court of Rovigo, sitting en banc,

at the public hearing of 31.3.2014, pronounced and published, after reading the operative part, the following

JUDGMENT

against:omissis...., PAOLO SCARONI,omissis....

THEREFORE

having regard to Articles 533, 535 of the Code of Criminal Procedure,

DECREES THATomissis....and PAOLO SCARONI are guilty of the offence referred to in Section B), excluding the aggravating circumstance, and sentences each of them to three years' imprisonment and to the payment of court costs;

having regard to Articles 28 and 29 of the Penal Code,

DECREES THATomissis....and PAOLO SCARONI are banned from public office for five years.

Having regard to Article 530 of the Code of Criminal Procedure,

....omissis....;

ACQUITSomissis...., PAOLO SCARONI,omissis.... of the charge referred to in Section A) because there is no case to answer;

having regard to Article 531of the Code of Criminal Procedure,

....omissis....Having regard to Articles 538 and ff. of the Code of Criminal Procedure,

SENTENCESomissis....and PAOLO SCARONI, jointly and severally, to pay compensation for the damage suffered by the plaintiffs, to be settled in a separate civil action, sentencing them henceforth to pay a provisional sum quantified as follows:

Ministry of the Environment, Land and Sea Protection: EUR 50,000.00;

Ministry of Health: EUR 100,000.00;

Province of Rovigo: EUR 70,000.00;

Municipality of Porto Tolle: EUR 70,000.00;

Municipality of Rosolina: EUR 70,000.00;

Italia Nostra (Non-Profit Organisation): EUR 10,000.00;

Legambiente (Non-Profit Organisation): EUR 20,000.00;

Greenpeace (Non-Profit Organisation): EUR 10,000.00;

Associazione Italiana per il WWF (NGO): EUR 10,000.00;

SENTENCESomissis....and PAOLO SCARONI, jointly and severally, to reimburse the costs of civil action and legal defence to the plaintiffs, quantified as a total of EUR 13,600.00 for the benefit of the NPOs Legambiente and Italia Nostra and as EUR 10,000.00 for each of the other plaintiffs, in addition to ancillary expenses.

Having regard to Art. 544, par. III of the Code of Criminal Procedure,

SPECIFIES that the deadline for filing the grounds of the judgment shall be ninety days. Rovigo, 31 March 2014.

The President (signature)
Dott. Cristina Angeletti



around the Plant.

Alberto Moro Visconti – Lawyer

Ave. Alberta Mons Visiconti. Ave. Enrico de Castiglione Ave. Roberta Guarren

Avv. Alsssandra Zunichi Avv. Edile Zechada

Milan, 4 July 2014

Subject: Notes – criminal proceeding no. 3946/08 R.G.N.R. – no. 20/13 R.G. Trib. at the Court of Rovigo

Mr Scaroni was indicted at the Court of Rovigo for the offences defined in article 437, paragraphs 1 and 2 (title A), and 434, paragraphs 1 and 2 (title B), of the Italian Penal Code. Summary

As defined in title A in the indictment, Mr Scaroni was accused – in the period when he was Managing Director of Enel S.p.A. (May 2002- May 2005) – he omitted to install plants and equipment for the prevention of accidents and/or injuries at the workplace, causing the risk of respiratory and heart diseases in the population living in the area of the Plant and, in particular, the paediatric population between 0 and 14 years of age, as a result of inhalation and ingestion of polluting agents, such as SO2, NOX, dust, particulate, metal, including vanadium, in the form of emissions between 1998 until 31 December 2004 from the Plant in Porto Tolle. This Plant was not environmentalised and it used heavy fuel oil with sulphur contents between 3 and 1%, i.e. exceeding 0,25%.

In other words, Mr Scaroni was accused of allowing the Plant to use a fuel with a high sulphur content, not fuels with a lower impact ... (the sulphur content in HFO varies from 3% to 1%, i.e. exceeding 0,25%)" (...) "omitting to adopt the best available technologies (MTD) to limit emissions of sulphur, nitrogen, dust and other polluting agents with water treatment plant and filtering systems ..., "not planning the heater technology update" (...) "live out to require the reconversion of the Plant pursuant to the regulation no. 36/97 of the Veneto Region...requiring the power stations in the Po Delta area to be fuelled with natural gas or other non-polluting alternative fuels – preventing any significant SO2 emissions – with the mandatory submission of reconversion plans within 12 months from the entry into force of the regulation, nor the later regional regulation no. 36/99 (published in the BURno. 18/99 dated 26/02/1999) requiring these plants to be fuelled with natural gas or other alternative fuels having an equal or lower impact – preventing any significant SO2 emissions – with the mandatory submission of reconversion plans within 18 months from the entry into force of the regulation as amended". Under the indictment, this resulted into a catastrophe, as hospital admissions in the period between 1998 and 2002 rose among children from 0 to 14 years of age living in the area

The Court of Rovigo acquitted Mr Scaroni on the grounds of no case to answer.

As defined in title A in the indictment, Mr Scaroni was accused – in the period when he was Managing Director of Enel S.p.A. (May 2002- May 2005) – of conducts causing a catastrophe (article 434, paragraph 1, of the Penal Code). In the indictment, the Plant in Porto Tolle caused a catastrophe, i.e. the increase in the number of hospital admissions for respiratory diseases among children between 0 and 14 years of age in the period from 1998 to 2002 in the area around the Plant.

The Court of Rovigo acquitted Mr Scaroni from the offence defined in article 434, paragraph 2, of the Penal Code on the grounds that the assumption of catastrophe was not justified.

The only accusation that the Court of Rovigo was called upon to ascertain concerned the offence defined in article 434, paragraph 1, of the Penal Code.

However, the conviction sentence does not to seem to be justified in the light of the first degree procedure. Therefore, it may be revised in the appeal procedure based on actual facts and explanations.

The accusation is based on the emissions from the Plant in Porto Tolle. In other words, Mr. Scaroni has been convicted for not having converted the Plant into a Plant fuelled with natural gas or for allowing the Plant to be fuelled with low sulphur content (BTZ), not with poor sulphur content (STZ), thus causing a risk for the local population and the environment.

In this context, the proceeding findings have proved that the offence that Mr. Scaroni has been accused is not grounded.

In this respect, the following points must be noted.

The Plant in Porto Tolle has always been compliant with the implicit authorisation and any subsequent regulations on the safety of the national energy system (Legislative Decrees no. 281/2002, 25/2003, and Law no. 83/2003).

The Plant has always been compliant with the relevant limits under the provisions of the above legislative decrees.

The reconversion into a Plant fuelled by gas would have resulted into a significantly higher environmental impact than the reconversion Enel suggested in the period Mr. Scaroni was Managing Director of Enel S.p.A.

The environmantalisation policies suggested by Enel at the time when Mr Scaroni was Managing Director received a positive evaluation from the *Commission VIA* of the Veneto Region on 26May 2003, the same Veneto Region on 13 June 2003, the Ministry for the protection of the heritage and culture on 17 December 2004, the *Commission VIA* of the Ministry of the Environment and Land Protection on 18 December 2004.

The Plant in Port Tolle only used very low sulphur fuel (below 1%) starting from 2003. In the period between 2000 and 2005, it was virtually impossible to secure a significant provisions of STZ fuel oil.

Therefore, no objections on the Plant in Porto Tolle are justified, when Mr. Scaroni was Managing Director of Enel S.p.A.

There are no actual risks for the environment and human health in the area of the Plant of Porto Tolle. The assumption for the offence defined in article 434, paragraph 1, of the Penal Code are based on such risks.

In this respect, data on air quality from Enel and ARPAV measuring stations have always been below the limits defined in the applicable regulations on the protection of ecosystems and human health.

Similarly, simulations of the impact of the Plant, performed by ARPAV (as directed from the Public Prosecutor) proved that the polluting impact of the Plant at local level has always been extremely low and largely below the limits specified in the applicable regulations on the protection of the environment and human health.

The conviction for the offence Mr Scaroni has been accused of requires a malicious conduct.

It is absolutely unthinkable that Mr Scaroni intentionally acted to cause a risk for human health and the environment. Such conduct, as specified in the indictment, equates to the operation of the Plant in Porto Tolle!

And this, not only because the Plant has always been compliant with limits under the applicable regulations, not only because data on local air quality have always been largely below limits specified in the applicable regulations on the protection of human health and the environment and vs national data.

As proved in the first degree proceeding, Mr Scaroni did not received any report on any risk for human health or the environment, which would have been obvious in the light of the above.

Additionally – and this is only a secondary remark regarding the above mentioned – statutes of limitation apply to the offence defined in article 434, paragraph 1, of the Penal Code should be considered prescribed.

Mr Scaroni has not held any official office in Enel Group since may 2005 and therefore he cannot be held responsible for events that have occurred after that date.

In this case, the limitation period amounts to 7.5 years from May 2005, hence the limitation period applies.

(Alberto Moro Visconti, Lawyer)

COURT of ROVIGO

The President

After having read the application filed on 18.06.2014 by Ms Cristina ANGELETTI, President of the Panel of Judges for the proceedings no. 20/13 (formerly 68/2012 Court General Register – no. 3946/2008 General Register of Criminal Record) against ...[omissis] .. and 9 others, decided by the judgement of 31.03.2014 and having acknowledged the reasons set forth therein;

after having also observed that the proceedings – also known as ENEL-bis and concerning the thermal power plant in Porto Tolle – had a wide media coverage because of the importance of the items involved, first of all the residents' right to health and a preliminary investigation mainly consisting of complex technical reports;

that, in addition to the involvement of another magistrate from a different district court (the President of the Panel of Judges), was necessary the postponement of the hearing of other proceedings already assigned to the members of the panel of judges and that now such proceedings must be heard without further postponements;

that, consequently, the authors of the judgement could not be authorized to be exempted from ordinary affairs, an exemption which they did not demand responsibly;

that, therefore, it is necessary to authorize the extension of the term of 90 days for further 90 days, as per article 544.3 of the Italian Code of Criminal Procedure;

order

the postponement of 90 days of the term specified in the part (dispositivo della sentenza) of the above judgement.

This is to be notified to the Panel of Judges and to the Supreme Magistrates' Council.

Rovigo, 27 June 2014

The President

