



Ministry for the Environment, Land and Sea

**Report on the determination of Italy's assigned amount
under Article 7, paragraph 4, of the Kyoto Protocol**

(December 2006)

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Introduction

This report explains the modalities for the accounting of the Italian assigned amount under Article 7, paragraph 4, of the Kyoto Protocol and pursuant to Decision 19/CP.7 FCCC/CP/2001/13/Add.2. taking into account also Article 8(1)(e) of Decision No 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol.

To facilitate the calculation of the assigned amount for the commitment period and demonstrate its capacity to account for its emissions and assigned amount, the complete time series of the national inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for all years from 1990 to 2004 is included. This information has been submitted to the European Union in the framework of the Monitoring Mechanism of greenhouse gas emissions and will be submitted to the UN Secretariat of Climate Change for implementing the Kyoto Protocol by the due date of 15 April 2006.

The report is divided into two parts in accordance with paragraphs 6-8 of the Annex to decision 13/CMP.1 (Modalities for the accounting of the assigned amounts under Article 7, paragraph 4, of the Kyoto Protocol).

PART I

1. Greenhouse gas inventory for 1990 – 2004

The methodologies used in the preparation of Italy's greenhouse gas inventory are consistent with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories and the IPCC Good Practice Guidance on Land Use, Land-Use Change and Forestry.

The greenhouse gas emissions time series for the period 1990 to 2004 is shown in Table 1.

GREENHOUSE GAS SOURCE AND SINK	1990														
	(base year)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	CO ₂ equivalent (Gg)														
1. Energy	422,893	422,766	421,843	418,343	411,948	435,611	431,520	435,737	446,847	452,300	455,826	460,631	462,737	477,464	480,283
2. Industrial Processes	36,544	36,165	35,572	32,736	31,399	34,590	31,556	32,032	32,489	32,817	34,979	37,206	37,460	38,955	41,982
3. Solvent and Other Product Use	2,394	2,338	2,338	2,295	2,217	2,182	2,284	2,284	2,371	2,354	2,297	2,221	2,230	2,179	2,124
4. Agriculture	40,577	41,372	40,863	41,163	40,641	40,349	40,126	41,210	40,530	40,949	39,929	39,421	38,222	37,841	37,839
5. Land-Use Change and Forestry ⁽¹⁾	-79,722	-101,215	-97,331	-82,397	-98,050	-103,206	-106,105	-99,318	-96,004	-103,525	-97,476	-110,156	-114,335	-111,341	-105,107
6. Waste	17,055	18,223	17,927	18,389	19,145	19,891	20,055	20,438	20,200	20,223	20,735	20,646	20,073	19,370	18,564
7. Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (without LULUCF)	519,464	520,864	518,542	512,926	505,351	532,622	525,541	531,701	542,437	548,643	553,766	560,125	560,722	575,809	580,793

Table 1. Italian greenhouse gas emissions and removals from 1990 to 2004 (Gg CO₂ equivalent)

Total greenhouse gas emissions exclude all emissions and removals from land use, land use change and forestry (LULUCF) in accordance with the Art 7.4 modalities for the accounting of assigned amount.

2. Identification of selected base year for HFCs, PFCs and SF6

Italy has chosen the year 1990 as the base year for the emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). The earlier choice of the year 1995 has been rejected due to the latest revised inventory information.

3. Calculation of Italy's assigned amount pursuant to Article 3(7) and (8) of the Kyoto Protocol

The proposal for Italy's emission level in terms of tonnes of carbon dioxide equivalent pursuant to Article 3(7) and (8) of the Kyoto Protocol, following the establishment of definitive base-year emission figures equal to 519,464,323 tonnes of CO₂ equivalent, taking into account the methodologies for estimating anthropogenic emissions by sources and removals by sinks referred to in Article 5(2) of the Kyoto Protocol and the modalities of assigned amount pursuant to Article 3(7) and (8) of the Kyoto Protocol is 2,428,495,710 tonnes of CO₂ equivalent.

The proposed figure has been drawn out in accordance with paragraph 5 of the Annex to decision 13/CMP.1 and is justified by the following considerations.

In the first quantified emission limitation and reduction commitment period, from 2008 to 2012, the Kyoto target for Italy, on the basis of the EU burden sharing agreement set out in Annex II to Decision 2002/358/EC and in accordance with Article 4 of the Kyoto Protocol, is equal to 93.5%.

The base year emissions for all greenhouse gases, including hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride is equal to 519,464,323 tonnes of CO₂ equivalent.

Land-use change and forestry, comprising all emissions by sources and removals by sinks under category 5 of the Revised 1996 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories, does not constitute a net source of greenhouse gas emissions.

Therefore, the proposed assigned amount is:

Italy's Assigned Amount =

$519,464,323 \text{ t CO}_2 \text{ eq (Base year emissions)} * 93.5\% * 5 = \mathbf{2,428,495,710 \text{ t CO}_2 \text{ equivalent}}$

PART II

4. Calculation of Italy's commitment period reserve

The national commitment period reserve is calculated in accordance with paragraph 6 of the Annex to decision 11/CMP.1 as 90% of the proposed assigned amount or 100% of five times its most recently reviewed inventory, whichever is the lowest.

The Italian commitment period reserve is calculated either as:

$$2,428,495,710 \text{ t CO}_2 \text{ equivalent} * 0.9 = 2,185,646,139 \text{ t CO}_2 \text{ equivalent}$$

or:

$$580,793,029 \text{ t CO}_2 \text{ equivalent (emission level 2004)} * 5 = 2,903,965,143 \text{ t CO}_2 \text{ equivalent}$$

Italy has interpreted the 'most recently reviewed inventory' as the year 2004, which will be reviewed by December 2006.

The Italian commitment period reserve is therefore **2,185,646,139 t CO₂ equivalent**.

Table 2 summarises the emission level and the commitment period reserve for Italy.

Emissions in base year (t CO ₂ eq)	Target burden sharing agreement (%)	Emission level (t CO ₂ eq)	Commitment period reserve (t CO ₂ eq)	Article 3.7
519,464,323	93.5	2,428,495,710	2,185,646,139	Does not apply

Table 2. Italy's emission level and commitment period reserve

5. Selection of threshold values for the forest definition to be used for reporting under Article 3, paragraphs 3 and 4 of Kyoto Protocol

The forest definition adopted by Italy agrees with the Food and Agriculture Organization of the United Nations definitions, therefore the threshold values for tree crown cover, land area and tree height are applied:

- a. a minimum area of land of 0.5 hectares;
- b. tree crown cover of 10 per cent;
- c. minimum tree height of 5 meters.

Deforestation data will be derived from administrative records, inventory data and mapping information. These sources of information will be also used to distinguish deforestation from areas harvested.

6. Selection of activities under Article 3, paragraph 4, for accounting in the first commitment period

Forest management:

Under SBSTA conclusion FCCC/SBSTA/2006/L.6 and related draft COP/MOP2 decision (FCCC/SBSTA/2006/L.6/Add.1), credits from forest management are capped, in the first commitment period, to 2,78 Mt C per year times fives. Italy will elect forest management as an activity under Article 3.4.

Cropland Management and Grazing Land management:

Italy will not elect Cropland management and Grazing Land management as an activity under Article 3.4.

Revegetation:

Italy will not elect revegetation as an activity under Article 3.4.

Election of activities under Article 3.4	
<i>Forest management</i>	Elected
<i>Cropland Management</i>	not elected
<i>Grazing Land management</i>	not elected
<i>Revegetation</i>	not elected

7. Identification of the accounting period for each activity

Italy intends to account for every Article 3.3 and 3.4 elected activities for the entire commitment period.

8. Description of Italy's national greenhouse gas inventory system

The description of the Italian national system is in accordance with Article 5(1) of the Kyoto Protocol.

The Agency for the Protection of the Environment and for Technical Services (APAT) is responsible for the compilation of the National Air Emission Inventory as single national entity for Italy. APAT is also responsible for the institutional, legal and procedural arrangements for the national system and for the strategic development of the national inventory.

In particular, as National Reference Centre of the European Environment Information and Observation Network (EIONET), APAT is required to prepare the national atmospheric emission inventory and the greenhouse gas inventory in order to ensure compliance with international commitments on the protection of the environment (Framework Convention on Climate Change, Convention on Long Range Transboundary Air Pollution, European Directives on emission ceilings). The complete GHG inventory is officially communicated to the Secretariat of the UNFCCC

and to the European Commission in the framework of the Greenhouse Gas Monitoring Mechanism, after endorsement by the Ministry for the Environment and Territory.

APAT is responsible for all aspects of national inventory preparation, reporting and quality management. Activities include the collection and processing of data from different data sources, the selection of appropriate emissions factors and estimation methods consistent with the IPCC 1996 Revised Guidelines, the IPCC Good Practice Guidance and Uncertainty management and the IPCC Good Practice Guidance for land use, land-use change and forestry, the compilation of the inventory following the QA/QC procedures, the assessment of uncertainty, the preparation of the National Inventory Report and the reporting through the Common reporting format, the response to the review process, the updating and data storage.

In addition, there are different institutions responsible for statistical basic data and publication, which are primary to APAT for carrying out emission estimates.

These institutions are part of a National Statistical System (Sistan), which provides national official statistics.

The National Statistical System (NSS) assures the homogeneity of the methods used for official statistics through a coordination plan, involving the entire public administration at central, regional and local levels by the Italian Decree No 322/89. The system is coordinated by the Italian National Statistical Institute (ISTAT) whereas other bodies belonging to the National Statistical System are the statistical offices of ministries, national agencies, regions and autonomous provinces, provinces, municipalities, research institutes, chambers of commerce, local governmental offices, some private agencies and private subjects who have specific characteristics determined by law.

A national statistical plan (Piano Statistico Nazionale, PSN) which defines surveys, data elaborations and project studies for a three-year period is approved and updated every year by a Prime Ministerial Decree. The latest Prime Ministerial Decree, which approved the three-year plan for 2004 to 2006, was issued on 23 April 2004 (<http://www.sistan.it/strum/adempimenti2005.doc>).

The main Sistan products, which are needed for the inventory compilation, are:

- National Statistical Yearbooks, Monthly Statistical Bulletins, by ISTAT (National Statistics Institute);
- Annual Report on the energy and environment, by ENEA (Agency for New Technologies, Energy and the Environment);
- National Energy Balance (annual), Petrochemical Bulletin (quarterly publication), by MAP (Ministry of Production Activities);
- Transport Statistics Yearbooks, by MINT (Ministry of Transportation);
- Annual Statistics on electrical energy in Italy, by GRTN (National Independent System Operator);
- Annual Report on Waste, by APAT.

The national emission inventory itself is also a Sistan product.

Further description of the national system can be found in the document that APAT is drafting on behalf of the Ministry for the Environment and Territory for the establishment of a robust national inventory system (building on the base of SISTAN), with a sound legal basis.

9. Description of Italy's national registry

The description is in accordance with the guidelines set down in UNFCCC's Decision 22/CP.8 (Additional sections to be incorporated in the guidelines for the preparation of the information required under Article 7, and in the guidelines for the review of information under Article 8, of the Kyoto Protocol). The national registry under Article 7 of the Kyoto Protocol has not been established to date. However, Italy is operating its registry under Article 19 of Directive 2003/87/CE establishing the EU Emission Trading Scheme and according to Regulation No. 2216/2004 of the European Commission, which require national registries to be compliant with the UN Data Exchange Standards specified for the Kyoto Protocol. The Italian registry is based on the GRETA registry software developed by the UK Department for Environment, Food and Rural Affairs (DEFRA) and used by many other Member States. Currently, the development of this software adheres to the standards specified in Draft #7 of the UN DES document. Italy has had the registry systems tested successfully with the EU Commission on 6 February 2006; the connection between the registry's production environment and the CITL has been established on 13 March 2006 and the Registry has since gone live, starting on 28 March 2006.

9.1. Name and contact information of the registry administrator designated by the Party to maintain the national registry

According to Article 3 of Ministerial Decree DEC/RAS/074/2006, Italy's Agency for the Protection of the Environment and for Technical Services (APAT) is responsible for developing, operating and maintaining the national registry under Directive 2003/87/CE.

With the entry into force of the Legislative Decree, 4 April 2006, n. 216, which fully transposes Directive 2003/87/CE into the national legislation and replaces the Ministerial Decree DEC/RAS/074/2006, the Directorate for Environmental Research and Development of the Italian Ministry for the Environment and Territory becomes responsible for developing, operating and maintaining the national registry under Directive 2003/87/CE.

At the moment the Directorate for Environmental Research and Development of the Italian Ministry for the Environment and Territory, while having the full responsibility for developing, operating and maintaining the national registry under Directive 2003/87/CE, has decided to delegate such tasks to APAT."

The address of the current Registry Administrator is the following:

Domenico Gaudio
APAT
Via Vitaliano Brancati, 48
00144 Roma
Italy
Tel. +39 06 50072540
Email: domenico.gaudio@apat.it

Please copy any correspondence with the Registry Administrator to the Ministry for the Environment and Territory. Contact details are as follows:

Mara Angeloni
Ministry for the Environment and Territory

Directorate for Environmental Research and Development
Via Cristoforo Colombo, 44
00147 Roma
Italy
Tel. +39 06 57228113
Email: angeloni.mara@minambiente.it

9.2. Any other Party with which the Party cooperates by maintaining their respective registries in a consolidated system

Italy's National Registry is currently linked to the other operational EU member states' National Registries by way of the European Commission CITL (Community Independent Transaction Log).

9.3. A description of the database structure used in the national registry

1. The GRETA registry system is implemented using a Microsoft SQL Server 2000 Enterprise Edition relational database management system with a dedicated data model for supporting registry operations.
2. The actual production environment consists in: 1 Firewall server + 1 webserver + 2 DB server in cluster configuration with two controllers fibre channel towards storage unit; the data directory is on the data storage device + 1 Tape Autoloader.

The actual register test environment is protected by 1 Firewall server. The test environment webserver has the same hardware and software configuration of the production web server. In this case the DB server is on the same unit. It will be reinstalled on another server.

Another back-up web server will be held off-line and in stand-by mode, with the same production IP address and the same software configuration, in order to allow a quick restart with the backup data. It is located in another building ready to substitute the register on the production site. The hardware will be the same of the actual production server, the DB server and the data storage are on the same unit, in order to allow a quick and safe restart in case of disaster.

3. The absolute maximum size of a SQL Server 2000 database is: 1,048,516 Terabytes or 50 Terabytes per single file entry. A Terabyte is equivalent to 10 to the power 12 (10^{12}) bytes;
4. SQL Server database model is also scalable up to 32 processors with 64 gigabytes of memory.

9.4. Description of how the national registry conforms to the technical standards for the purpose of ensuring the accurate, transparent and efficient exchange of data between national registries, the clean development registry and the independent transaction log, including (1) to (5) below.

1. The GRETA registry system has been developed for the EU Emissions Trading Scheme. This scheme requires its Member States' registries to be compliant with the UN Data Exchange Standards specified for the Kyoto Protocol. Currently, the development adheres to the standards specified in Draft #7 of the UN DES document. Italy has had the registry systems tested successfully with the EU Commission on 6 February 2006; the connection

between the registry's production environment and the CITL has been established on 13 March 2006 and the Registry has since gone live, starting on 28 March 2006.

2. As part of the GRETA Registry development, a functionality has been developed to perform issuance, conversion, external transfer, (voluntary) cancellation, retirement and Reconciliation processes using XML messages and web-services as specified in draft #7 of the UN Data Exchange Standards document.
3. In addition, 24 Hour Clean-up, Transaction Status enquiry, Time Synchronisation, Data Logging requirements (including Transaction Log, Reconciliation Log, Internal Audit Log and Message Archive) and the different identifier formats as specified in the UN DES document have been implemented. Extensive tests on these functionalities can therefore be arranged with the ITL test system once it becomes available.
4. With regards to performing tests with the CDM Registry (external transfer for example) this can also be performed once the ITL test system becomes available. However, certain requirements still need to be developed, e.g. handling tCERs and lCERs.
5. GRETA has identified the following additional Kyoto functionality that would need to be developed for the Registry software and tested against the ITL test system: -
 - a. Replacement of t-CER or l-CER,
 - b. Carry-Over,
 - c. Expiry Date Change (for t-CER and l-CER), and
 - d. The whole area of functionality for ITL Notices (and the Notification Log)

GRETA intends to schedule the development of these functionalities in the future releases in order to meet with the timetable required for Kyoto.

9.5. A description of the formats used in the national registry for account numbers, serial numbers for ERUs, CERs, AAUs, and RMUs, including project identifiers and transaction numbers

Formats are as specified in the UN DES #7 Annex F – Definition of Identifiers.
The display format is controlled via the registries web configuration file.

9.6. A list, and the electronic format, of the information transmitted electronically when transferring ERUs, CERs, AAUs, and/or RMUs to other registries

Information will be transmitted to other registries in the format of the messages specified in the UN DES #7 via the ITL.

9.7. A list, and the electronic format, of the information transmitted electronically when acquiring ERUs, CERs, AAUs, and/or RMUs from other national registries or the CDM registry

Acknowledgement information will be transmitted to other registries in the format of the messages specified in the UN DES #7 via the ITL.

9.8. A list, and the electronic format, of the information transmitted electronically from the national registry to the independent transaction log when issuing, transferring, acquiring, canceling and retiring ERUs, CERs, AAUs, and/or RMUs.

Information will be transmitted to the ITL in the format of the messages specified in the UN DES #7.

9.9. An explanation of the procedures employed in the national registry to prevent discrepancies in the issuance, transfer, acquisition, cancellation and retirement of ERUs, CERs, AAUs, and/or RMUs

In order to minimise discrepancies between the Registry and the Transaction Log, the following approach has been adopted for the Registry system development for the EU Emissions Trading Scheme. The same approach would be adopted for the development of the remaining Kyoto functionality for GRETA's Registry software: -

1. Communications between the National Registry and the ITL would be via web-services using XML messages – as specified in the UN DES document. These web-services, XML message format and the processing sequence would be as per that specified in the UN DES document;
2. As far as possible, the Registry shall validate data entries against the list of checks that are performed by the ITL – as documented in Annex E of the UN DES Annexes document – before forwarding the request to the ITL for processing. This would help to minimize sending incorrect information to the ITL for approval;
3. All units that are involved in a transaction shall be earmarked internally within the Registry; thereby preventing the units from being involved in another transaction until a response has been received from the ITL and the current transaction has been completed;
4. The web-service that sends the message to the ITL for processing will ensure that a message received acknowledgement is received from the ITL before completing the submission of the message. Where no acknowledgement message has been received following a number of retries, the web-service would terminate the submission and roll-back any changes made to the unit blocks that were involved;
5. Where a 24 hour clean-up message is received from the ITL, the existing web-service would rolling back any pending transactions and the units that were involved, thereby preventing any discrepancies in the unit blocks between the Registry and the ITL; and
6. Finally, if an unforeseen failure were to occur, the data discrepancies between our Registry and the ITL can be corrected via a manual intervention function within our registry. Following this, reconciliation will be performed to validate that the data is in sync between the Registry and the ITL.

9.10. An overview of the security measures employed in the national registry to deter unauthorized manipulations and minimize operator error

The security measures employed in the national registry of Italy are based on the requirements laid out in Annex XV of CE 2216/2004 Register regulation. They are reported in Appendix 1.

Significant attention is placed on verifying the identity of the operator's or organization's legal representative who is signing the nomination of the account primary and secondary authorized representatives.

For the operators' accounts, such verification requires a "visura camerale", a document produced by the Italian Chamber of Commerce identifying the legal representatives of a specific commercial company. Non Italian Companies are requested to provide an equivalent document, identifying the Company's representatives and their roles and responsibilities.

The same document, "visura camerale" or an equivalent (e.g. statute), is requested for organizations applying for an account.

For individual accounts, only a signed copy of an identity document is required (identity card or passport for non Italian persons).

All persons involved, those who delegate and the authorized representatives, need to send a signed copy of an identity document (identity card or passport for non Italians).

At present, no fees are required for opening accounts in the Italian Registry.

9.11. A list of the information publicly accessible through the user interface to the national registry

GRETA intends to schedule the development of publicly accessible information in its future releases in order to meet with the timetable required for Kyoto. These reports will be displayed publicly in addition to the reports described below.

9.12. An explanation of how to access information through the user interface of the national registry

1. Open Internet Explorer (or similar) and browse to the following URL:

<http://www.greta.sinanet.apat.it>

2. Click on the link to the national registry

3. Select the public reports link at the bottom of the page. The user can choose from:

- a. User details – unchanged, updated, created
- b. Account details – unchanged, updated, created
- c. Operator holding account – unchanged, updated, created
- d. There will be a number of other reports available in Commitment Period 1, but these have not yet been developed.

9.13. A description of measures taken to safeguard, maintain and recover data in order to ensure the integrity of data storage and the recovery of registry services in the event of a disaster

System and procedures adopted to ensure the integrity of data storage and the recovery of registry services in the event of a disaster are reported in Appendix 2.

9.14. The results of any test procedures that might be available or developed with the aim of testing the performance, procedures and security measures of the national registry undertaken pursuant to the provisions of decision 19/CP.7 relating to the technical standards for data exchange between registry systems

Procedures for testing the performance, procedures and security measures of the national registry are still largely under development:

1. Currently, the GRETA registry system for the EU Emissions Trading Scheme uses the security mechanism as specified within the EU Regulation; (Annex XV); that is, it uses basic authentication and SSL.
2. For Kyoto, digital cert and VPN will be used when the ITL becomes available. This will be included in future phase of the Greta registry development project.
3. No existing performance data or test procedure is currently available.

Appendix 1

Security requirements as laid out in Annex XV of CE 2216/2004 Register regulation

Communication between CITL and Italian registry

Secure transmission has been achieved through the use of SSL technology of 128 bit encryption as successfully tested on 28th June 2005 during communication between CITL and the Italian registry. A digital certificate supplied by CERTIPOST has been installed to achieve the test. Identities and password have been set and stored according to article 1.b) of Annex XV of the Register regulation. The digital certificate to authenticate the national registry web site has been supplied by CERTIPOST at the end of November 2005.

Communication link between the Italian registry and all authorised representatives in this registry

Each authorised representative is authenticated through the use of usernames and passwords registered as valid by the registry.

The system for issuing usernames and passwords has been implemented in the GRETA software supplied by DEFRA, UK, pursuant to article 4 of the Annex XV of the CE 2216/2004 Register regulation.

Communication link between the Italian registry and the general public

The GRETA software implements articles 5 and 6 of the Annex XV of the Register regulation, in particular the public area of the Italian registry website does not require authentication of its users representing the general public and does not allow them to directly access data from the database of that registry. Data which is publicly accessible in accordance with Annex XVI can be accessed via a separate database.

General security requirements for the Community independent transaction log and each registry

The following general security requirements have been applied to the Italian registry:

- (a) A firewall protects the Italian registry from the Internet, and has been configured as strictly as possible to limit traffic to and from the Internet.
- (b) The Italian registry runs regular virus scans on all nodes, workstations and servers within their networks. Anti-virus software will be updated regularly.
- (c) The Italian registry ensures that all node, workstation and server software is correctly configured and routinely patched as security and functional updates are released.
- (d) When necessary, the Italian registry will apply additional security requirements to ensure that the registry system is able to respond to new security threats.

Appendix 2

System and procedures for safeguarding of data

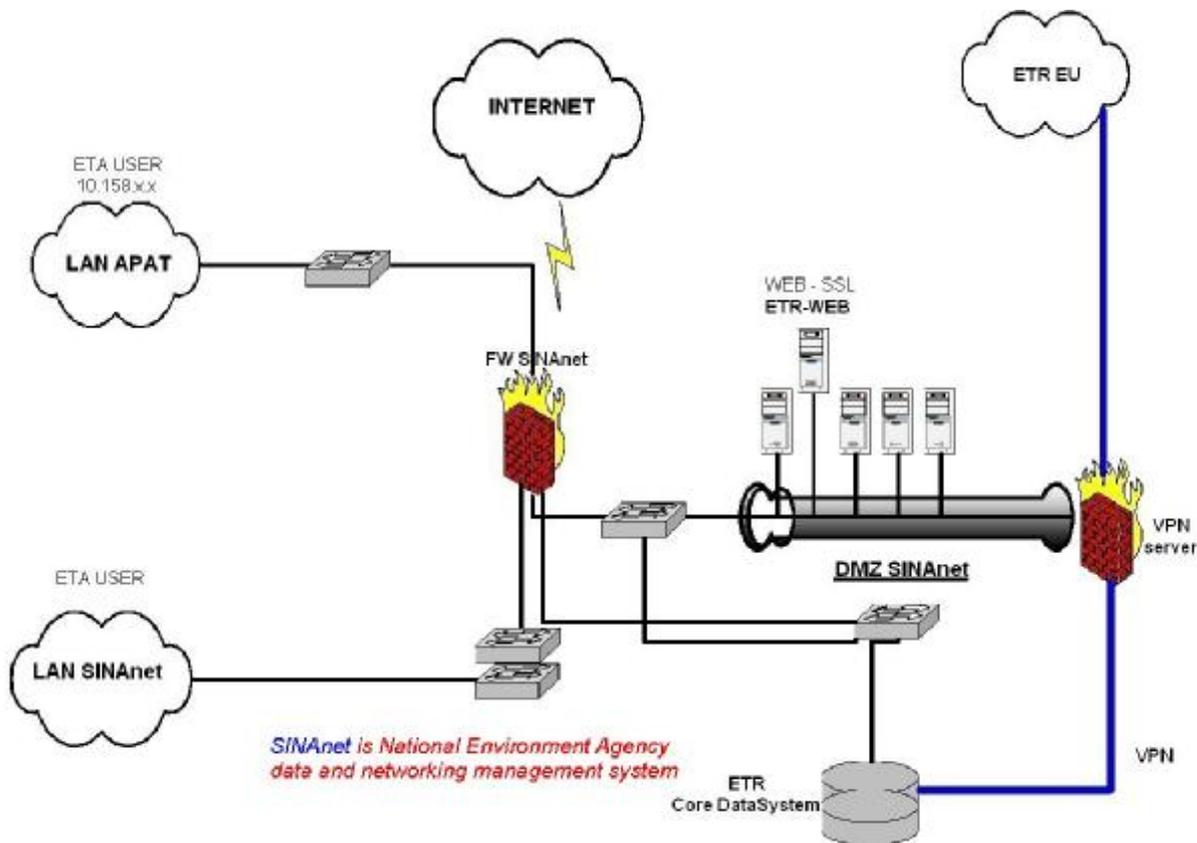
The actual register production environment has been replicated on another external server having the same hardware configuration, in order to allow a quick re-installation. This back-up server will be held in another building, off-line and in stand-by mode, with the same IP address (see technical specification in appendix 2).

Scheduled backup procedures

1. **DB Cluster configuration:** the Database is connected to the storage via two controllers, each DB has a controller fibre channel connected to another storage unit controller
2. **Daily database back-up** (00:00 a.m.) on the data directory located on the data storage device (12 x 72.8 GB disks in RAID 5 configuration).
3. **Daily database back-up** (03:00 a.m.) on the local Tape autoloader device
4. **Daily database back-up** (04:00 a.m.) on a remote device in another building.

Safety networking configuration

1. Firewall server with Linux Operative System, IP table to route towards the web server with a private IP address.
2. Database reachable by web server via MSSQL 1433 standard port, only.
3. Two copies of the firewall configuration script are stored on different units.
4. A web server physical image has been created by the “Ghost” utility (Symantec); it has to be replicated for each change in web server configuration.



Physical safeguarding of data and devices

1. Cluster configuration will ensure continuous operational activities.
2. The back-up environment, backup tapes and configuration disks are located in another building.
3. The rack systems are powered by safety and continuous stationary engine.
4. Hardware failure and corrupted devices will be replaced in the same working day or in the next one.
5. Software malfunctions will be resolved by on site technicians in the same working day or in the next one.
6. The whole system will be protected inside a security room, with restricted access and 24h armed surveillance.

Prompt recovery procedures (safety conditions and disaster event management)

Time to restore the complete system: close to 4 hours. Scheduled operations (one time for each new Register software version):

1. **Firewall restore:** installation of Linux O.S. on a generic server and IP-table script launch;
2. **Webserver restore:** Mounting of the last web server image generated by Ghost on the hardware clone device held in standby mode in the other building;
3. **DB restore:** MSSQL Server 2000 re-installation of on the other external back-up unit and data reload from tape.