Mapping CCS in Italy

Report Summary

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Energy production and emission breakdown from different fossil fuels

	% of power generation	TWh (electricity)	CO2 emissions (million tonnes) from electricity
Coal	14 %	44,208	40,03
Gas	50 %	158,079	58,93
Oil	15 %	45,875	22,43
Total	**79 %**	**248,162**	**121,39**

Scenarios for different greenhouse gas reduction trajectories

There is a governmental scenario regarding Italy's goals for 2020, but concrete measures to reach it will be created in the adoption process of EU Climate Package. Others come from Research Institutions and NGOs.

Title	Organisation	Years covered	Brief description
National Action Plan for GHGs emissions reduction (approved in December 2002)	MATT	2003-2010	Total emissions must be reduced of 6,5% in comparison with 1990 figures: it means that compared with the expected 2010 emissions, 93 Mt CO2 eq./year should be cut (17% of the total 2010 expected emissions); of this reduction, 27% should come from electricity sector
Energy: issues and challenges for Europe and for Italy. 2007 Position Paper of Italian Government	Presidency of Italian Ministries Council	2007-2020	So called "Scenario 2020". It foresees an overall energy production of 321 TWh, whose 104 TWh from REs. and 217 TWh, from traditional thermo-electric. It means also a stabilization in the production (321 TWh foreseen in 2020 against 314 TWh of 2007), thanks to energy efficiency measures of about 80 TWh. At the same time it foresees doubling production from REs and a reduction of 22% (in comnparison with 2007 level) of traditional thermo-electric.
Italian energy scenarios: assessment on different energy policy options (2004)	ENEA	Up to 2020	Adopting MARKAL and MACRO analysis models, 4 scenarios are described: 1. "Tendency" scenario, 2. "Renewable" scenario; 3. "Energy efficiency" scenario; 4. "Carbon Tax" scenario. The latter proposes a progressive tax on CO2 emissions, starting from 25$/ton in 2005 up to 100$/ton in 2020
Dossier 2009: Kyoto Protocol four years later	Fondazione Sviluppo Sostenibile	2009-2012	2012 emissions (BAU scenario): 515 Mton. REs, energy efficiency, etc.: reduction of 12 Mton. Institution of CO2 emission inventory: reduction of other 10,2 Mton. Reduced emissions with Flexible mechanisms: other 3,42 Mton reduction. New total emissions: 489 Mton, i.e. - 5,4% of 1990 level (Kyoto target for Italy: - 6,5%).
Climate changes, environnement and energy: guidelines for a national strategy for mitigation and adaptation	WWF - Italy	2020 and 2030	Consumption reduction of 20% by 2020 and of 50% by 2030, thanks mainly to energy efficiency. Res should tripleing by 2020, covering 30% of total consumption, and increasing of another 25% by 2030, up to 50% of the total energy demand. Fossil fuels-based energy should decrease by 2030 of 50% and cover the other 50% of

			energy consumption

New Thermal Power Plants

At the time being and with available data there are 11 (Tab.1) power plant-related projects (for new building, or for empowering, or for reconversion) that have accomplished with all the requirements stated by the law (esp. EIA) and have overpassed positively the assessments carried out by the different administrative levels (State, Region, concerned municipalities). Therefore they have obtained the final authorization (Ministry of Economic Development Decree), and are in the physical construction phase. Only one (owned by ENEL) is coal-fired.

There are other 10 (Tab.2) power plant-related projects under Ministry of Environment assessment (esp. Environmental Impact Assessment process); 2 of them – owned both by ENEL - are coal-fired.

Finally there are 25 (Tab.3) power plant-related projects under Ministry of Economic Development assessment; 3 of them – owned by ENEL, Tirreno Power and Endesa Italy - are coal-fired.

Tab.1: Power plants authorized and still in the construction phase

Owner	Fuel	Power (MW)	Decree year	City	Status
AEM Torino	gas	770	2003	Moncalieri (TO)	Under construction
ENEL	coal	2.000	2004	Civitavecchia (RM)	Physical construction accomplished. Starting up of the operational phase for 1 unit, in next 12 months for the other 2
Sorgenia	gas	770	2004	Modugno (BA)	Under construction
Sorgenia	gas	770	2005	Turano-Bertonico (LO)	Under construction
Sorgenia S.p.a.	gas	750	2006	Aprilia (LT)	Under construction
Tirreno Power	gas	400	2005	Napoli (NA)	Under construction
AbruzzoEnergia	gas	760	2004	Gissi (CH)	Under construction
EDISON	gas	780	2002	Orta di Atella (CE)	Under construction
Energy Plus	gas	780	2004	Salerno (SA)	Under construction
Eurosviluppo Elettrica	gas	800	2004	Scandale (KR)	Under construction
EN PLUS	gas	390	2002	San Severo (FG)	Under construction

Tab.2: Power plants under Ministry of Environment assessment

Owner	Fuel	Power (MW)	City	Status

ROSEN Rosignano Energia	gas	510	Rosignano Marittimo (LI)	Obtained AIA (Integrated Environmental Authorization); EIA ongoing
ENEL	gas	320	Castel San Giovanni (PC)	Obtained AIA (Integrated Environmental Authorization); EIA ongoing
ENEL	Coal+biomass+CDR (fuel from solid waste treatment)	1120	Fusina (VE)	Obtained AIA (Integrated Environmental Authorization); EIA not necessary because it's a reconversion with a "greener" fuel. Decree foreseen end of 2009
Roma Energia	gas	800	Rome (RM)	EIA positive
Union Power	gas	400	Parona (PV)	EIA positive
E.ON-A2A	Gas+biomass	1.000	Monfalcone (GO)	Obtained AIA (Integrated Environmental Authorization); EIA not necessary because it's a reconversion with a "greener" fuel
Luminosa	gas	385	Benevento (BN)	EIA positive
Ecofuture	gas	400	Presenzano (CE)	EIA positive
EDISON	gas	800	Pianopoli (CZ)	EIA undergoing
ENEL	coal	50	Brindisi (BR)	With oxyfuel CCS unit. EIA not necessary, problems for land use authorizations. Decree foreseen end of 2009

Tab.3: Power plants under Ministry of Economic Development assessment

Owner	Fuel	Power (MW)	City	Status
Alpi Energia	Gas	580	Falconara Marittima (AN)	Assessments undergoing
EDISON	Gas	740	Porto Marghera (VE)	Assessments undergoing
Centro Energia	Gas	180	Teverola (CE)	Assessments undergoing
EniPower	Gas	240	Taranto (TA)	Assessments undergoing
EDISON	Gas	400	Piedimonte S. Germano (FR)	Assessments undergoing
Tirreno Power	Coal	400	Valleggia di Quiliano (SV)	Assessments undergoing. No other data available (Responsible absent for holiday)
ENDESA Italia	Coal+biomass	410	Fiume Santo (SS)	Assessments undergoing. No other data available (Responsible absent for holiday)
ENEL	Coal	2.640	Porto Tolle (RO)	Final steps of assessment undergoing, Decree expected end of 2009
ILVA	gas	600	Taranto (TA)	Assessments undergoing
Iride Energia	Gas	400	Torino (TO)	Assessments undergoing
International Power Italia	Gas	780	Offlaga (BS)	Assessments undergoing
Italgen	Gas	190	Villa di Serio (BG)	Assessments undergoing
Sithe Global Italia	Gas	980	Teramo (TE)	Assessments undergoing
EDISON	Gas	400	Flumeri (AV)	Assessments undergoing
EDISON	Gas	850	Presenzano (CE)	Assessments undergoing

HERA	Gas	230	Coriano (RN)	Assessments undergoing
Edipower	Gas	780	Piacenza (PC)	Assessments undergoing
ENDESA Italia	Gas	980	Monfalcone (GO)	Assessments undergoing
ASM Brescia	Gas	780	Brescia (BS)	Assessments undergoing
ENDESA Italia	Gas+vegetal oil	236	Ostiglia (MN)	Assessments undergoing
Morano Energia	gas	800	Morano sul Po (AL)	Assessments undergoing
EDIPOWER	Gas	1.410	Brindisi (BR)	Assessments undergoing
TERNI – Società per l'Industria e l'Elettrificazione	Gas	800	Terni (TR)	Assessments undergoing
West Energy	Gas	800	Loreo (RO)	Assessments undergoing
Elettra GLL	Gas	770	Cona (VE)	Assessments undergoing

State of regulatory process for CCS

Implementation of the CO_2 storage directive has just started. The first problem is that the two Ministries responsible for this are mainly the Ministry of Environment and the Ministry for Economic Development, and they are "struggling" for leading the process. Details for officers potentially influencing the procedure are provided below:

Name	Position	Contact details
Ministry of Environment Physical Planning and Public Works		
Mr. Corrado Clini	Director General of DG "Environmental R&D"	tel. 06/57228100
Mrs. Valeria Rizzo	DG "Environmental R&D" – Head of Div. VI "Multilateral Cooperation"	Tel. 06/57228106
Mr. Sebastiano Serra	DG "Environmental R&D": CCS Expert	tel. 06/57228112
Ministry of Development		
Mr. Franco Terlizzese	Director General of Energy Resources	tel. 06/47052859
Mr. Marcello Capra	Energy Department – Technical Secretariat Responsible	tel. 06/47053550

National CCS supporting programs and plans for full-scale CCS

- Ministry for Economic Development is currently funding ENEA, CNR, SOTACARBO and CESI Ricerche for researches on CCS; total value 10-15 million euro for the period 2009-2011
- In the framework of G8 "Energy meeting" (Rome 24/05/09) Italy signed an agreement with US government on clean coal and carbon capturing technology, foreseeing in particular exchange of researchers and know-how between universities and laboratories, coordination and monitoring of joint projects, study and development of new technology, models to identify new sites to store carbon dioxide, raising public awareness on the advantages of this technology.
- On the 15/07/09 ENEL applied for EEPR funds (100 million euro) the Porto Tolle CCS demo project, i.e. a 300 MW CCS unit in a coal-fired power plant of more than 2.500 MW (no official data available at the moment)

- With the Law n.99 of the July 23 2009 (published in the Official Gazette n.176 on July 31 2009) and titled "Measures for firms development and internalization, and for energy", the Italian Government included CCS among the 4 energy fields (the others are "IV generation" nuclear, REs and low-carbon technologies) where to invest (it is not yet clear how much) for research and development. It is foreseen also the exploitation of coal mines in Sardinia (Sulcis site) for production of electricity with CCS.
- Italian research bodies, such as INGV, ENEA, several Universities, etc. have participated / are participating in projects EU-funded on CCS technology, like CO2-GeoNet, CO2-Net, Dynamis .
- INGV has a huge knowledge on climate change in general and CO2 storage in particular.
- ENEL and ENI have a general agreement for CCS development, are carrying on several research activities, and they are going to set up some little pilot projects (oxyfuel unit in Brindisi, post combustion in Brindisi, pre-combustion in Fusina)

There is not yet a specific plan for full-scale CCS by the Italian government, although the recently issued Law n.99 push forward the relevant R&D. A coherent government-owned Climate Change strategy is still missing, and high priority is given to REs (by previous government, ended in 2008), and nuclear (current government). Other hints:

- Lack of juridical framework for authorizations for transport and for storage (except in gas-camps): it will causes problems for Porto Tolle CCS demo project..
- For ENEL CCS is interesting from an economic point of view because it want to shift electricity production from gas to coal.
- For ENI CCS is a way for exploit/recovery oil camps in northern Italy.
- For other industrial actors CCS is still expensive and not necessary (since it's not obligatory).