NATIONAL ENERGY AND ENERGY POLICY OVERVIEW

Almost 60% of Italy's energy comes from oil, most of which is imported. Gas accounts for another 30% of energy use. Coal, hydro and renewables provide for most of the rest, as shown in Figure 4. Most electricity is generated with oil, though natural gas and, to a lesser extent, renewables are increasingly important sources of power. Table 2 provides information on Italy's dependence on imports, its energy intensity and its greenhouse gas emissions.

Figure 4: Total Primary Energy Use by Fuel Type[i]

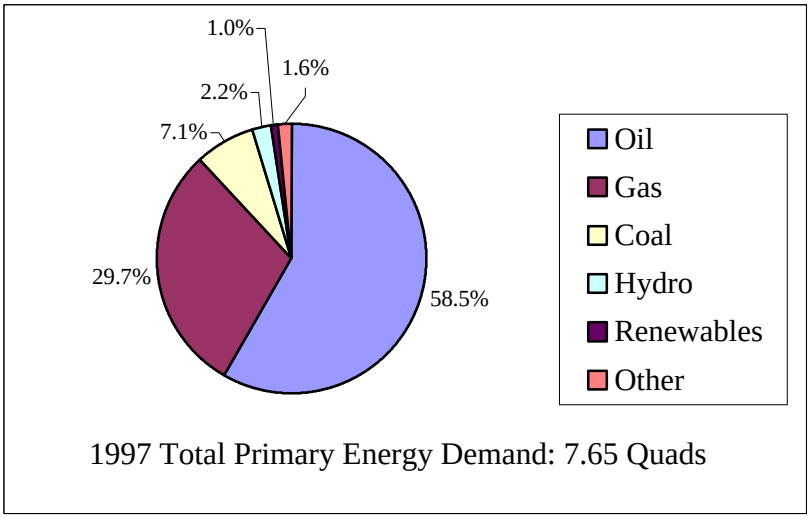

Table 2: 1997 Energy Snapshot[ii]

Dependence on Energy Imports: 80%	Energy-Related Carbon Emissions: 116 million metric tons (1.86% of world carbon emissions)
Energy Consumption per Capita: 130.7 million Btu	Carbon Emissions per Capita: 1.98 metric tons
Energy Consumption per $1 of GDP: 5,658 Btu	Carbon Emissions per $1 GDP: 85.6 metric tons
"Kyoto Commitment": 6.5% reduction in GHG emissions by 2008-2012[1]	

Italy is one of the least energy intensive countries in the world.[iii] Nonetheless, its energy policies are very complex, which is partly a result of the complex energy pressures facing Italy and partly a result of the Italian political process. There are more than 300 energy laws in Italy at the national level. A compendium prepared for the National Conference on Energy and Environment in 1998 sums up the evolution of energy legislation and planning in Italy with this statement: "Too many laws, some well done, others less so, often in contradiction with one another: what is needed are simplification, coherence, flexibility and separation between the legislation and the technical regulations."[iv] The Ministry of Industry, Commerce and Handicraft (MICA) is the main body responsible for implementing Italian energy policy.

Italian energy policy has changed dramatically since 1988, the year in which the last National Energy Plan (PEN) was issued. The issues that are in the forefront of Italian energy policy today include energy

[1] Under the Kyoto Protocol, the European Union as a whole committed itself to an 8% reduction in greenhouse gas emissions between 2008-2012. Under a separate EU agreement, the Community Strategy on Climate Change, however, individual member states committed themselves to different greenhouse gas emission reduction trajectories in support of the EU's overall commitment.

deregulation, environmental protection, energy security, taxation and economic growth. Before each of these issues is discussed individually, however, it is worth highlighting a few unique aspects of Italian energy policy.

- Italy is one of the few countries in the world to have closed down operating nuclear power plants following a moratorium on nuclear power generation. Italy took this decision by referendum in 1987 in the wake of Chernobyl. Prior to the ban, 3.8% of Italy's domestic power was nuclear and Italy had 1.15 GW of nuclear capacity. The moratorium was in effect through 1992; however, the Italian government has extended it indefinitely.[v]
- Italian energy taxes are quite high, even by European standards. This has helped Italy achieve its low energy intensity. The taxes are a result of several policy drivers including the 1973 oil shock, continued energy security concerns, and a desire to protect the environment.
- While European integration has encouraged Italy to make its energy industry more competitive, at the same time Italy has taken several steps to make its energy use more efficient and less carbon-intensive. This includes progressive electricity tariffs in which households must pay higher tariffs when they consume more electricity, and requirements that electricity producers sell a certain volume of electricity from renewable sources to the grid. Electricity producers also reap benefits when they sell cogenerated electricity to the grid.

Energy Deregulation: Competition in Italy's energy industry has been very limited. Until recently, most of Italy's energy sector was in the hands of state corporations, most notably ENEL and ENI (the state electricity and hydrocarbon companies, respectively). Both companies were transformed into joint stock companies in the early 1990s, and major share blocks were sold in the mid 1990s. Both firms are now primarily privately held. ENEL and ENI were privatized in anticipation of retail competition in the European Union.

European integration has meant that European Union members must open their electricity and energy markets to other member states. In February 1997 and March 1999, the Italian parliament passed new decrees regarding the domestic electricity market. The 1999 decree breaks the state electricity monopoly, ENEL, into generation and distribution companies and introduces competition between providers. In addition to ENEL, there are also municipal electric companies and self-producers in industry; ENEL accounts for over 80% of total power production in Italy.

Before 1999, there was no retail competition although there were laws favoring cogeneration in industry. In fact, until 1991, even companies in the same group could not exchange electricity.[vi] "Law 9/91" enacted in 1991 allowed industrial companies and municipal utilities to produce power for their own needs and sell any excess to the national grid.[vii] The March 1999 legislative decree regarding the power market opened the way for retail competition. Under this law, no single company will be allowed to produce or import more than 50% of Italy's electricity production or imports. Large consumers will be able to purchase electricity from distributors or wholesalers in Italy or abroad, though smaller consumers will be tied to a single distributor. Entities throughout Europe will have equal access to sell power to the grid or serve as wholesalers. The government will still maintain control of the power grid, though it may sign concessions for operation of it.[viii] The 1999 decree also encourages cogeneration and production of renewable energy.[2]

In addition, Italy has been introducing competition into its natural gas and oil sectors. It has sold off large packets of ENI shares, so that now less than 40% of the company is state-owned.[ix] The Italian government has also established an Authority for Electricity and Gas that will ensure fair competition and access to the grid in these energy markets.[x] This is a significant innovation because it breaks the energy monopolies' hold on the market.

Environmental Protection: While European competition has been driving Italy's efforts to reform its energy sector, Italy has taken advantage of this situation to introduce environmentally friendly energy policies. Italy's commitment to reduce carbon emissions by at least 6.5% of its 1990 level is helping to crystallize this policy. Italy is committed to increasing its use of renewable energy and natural gas and improving energy efficiency to meet its Kyoto commitments. Table 3 below summarizes Italy's greenhouse gas emission goals.

Table 3: National Actions to Achieve Greenhouse Gas Emission Goals and Associated Emission Reductions (in Mt CO_2)[xi]

Action	2002	2006	2008-2012
Increased Efficiency of Electricity Generation	4 to 5	10 to 12	20 to 23
Reduction of Energy Consumption in the Transport Sector	4 to 6	9 to 11	18 to 21
Energy Production from Renewables	4 to 5	7 to 9	18 to 20
Reduction of Energy Consumption in the Industrial, Residential and Service Sectors	6 to 7	12 to 14	24 to 29
Emission Reductions from Non-Energy Sectors	2	7 to 9	15 to 19
CO_2 Absorption by Forests			0.7
Total	20 to 25	45 to 55	95 to 112

Because Italy's energy intensity is already quite low, the task of reducing emissions is even more challenging. Most of the items listed in Table 3 have implementation plans

[2] The renewable energy clauses of this law are particularly interesting. All companies producing or importing non-renewable power in one year must introduce into the grid in the next year new renewable power equivalent to 2% of the non-renewable power sold in the first year.

that spell out how Italy will reduce emissions in that area. Renewable energy strategies and goals, for example, are described in the Italian "White Book" on renewable energy.[xii] The Ministry of Environment has also signed a voluntary agreement with FIAT on reducing greenhouse gas emissions from cars, an agreement that supports the second action item listed. This was the first voluntary agreement in Italy relating to greenhouse gas emissions. According to the agreement, FIAT cars in 2010 will emit 23% less carbon dioxide per kilometer than the average 1990 models.[xiii]

Italy has also introduced a series of laws, decrees and regulations in recent years to reduce local atmospheric pollution from fossil fuel combustion. The Italian government first signed a Clean Air Act in 1966, which set guidelines for controlling pollution. Additional regulations and decrees in 1983 and 1988 established the maximum allowable concentrations of certain air pollutants. Italy has made great gains in reducing sulfur dioxide emissions primarily by substituting natural gas for coal. The Ministry of Environment in Italy was established only in 1986; in 1994 Italy established the Environmental Protection Agency, which co-exists with the Ministry. Environmental organizations have grown in strength in Italy over the past decade. The largest of these is Legambiente (Environmental League), a former leader of which is now a prominent parliamentarian.[xiv]

Environmental laws have actually prompted much of ENEL and ENI's research in recent years. ENEL's research program in 1995, for example, was geared primarily toward reducing emissions or environmental impact and improving conversion efficiency.[xv]

Energy Security: Like most OECD nations, Italy faced major energy shortages during the 1970s oil crisis. Since then, Italy has improved its efficiency, reducing import requirements, although it still imports a high percentage of its total energy consumed. This is particularly true for oil and coal (93% and 84% imported, respectively). Italy also imports the majority of its gas.[xvi] Thirty-one percent of Italy's oil imports comes from Libya, 41% from various countries in the Middle East, 11% from the former Soviet Union and 17% from other countries. Its natural gas imports come from a similar mix of countries, with a slightly higher reliance on the North Sea.[xvii] Its coal comes primarily from the U.S., Australia and South Africa.[xviii]

Because of its heavy reliance on energy from the Mediterranean basin, Italy has tried to promote regional cooperation and development with most of its Southern neighbors. This cooperation is through bilateral technical assistance, assistance under the Mediterranean regional sea convention, and commercial contracts for developing regional hydrocarbon resources. While more comprehensive and integrated energy networks in the European Union could help Italy weather short-term supply disruptions, such integration is unlikely to help Italy in long-term supply disruptions; the government has not highlighted this integration as a key component of its long-term energy security policy.[xix]

The government and domestic energy companies have also tried to increase domestic energy production. Large gas and oil fields, however, are not always in the most environmentally benign locations. One of Italy's largest domestic natural gas reserves is located in the Northern Adriatic, but because of environmental concerns and the potential

subsidence of Venice, the government has decided not to allow gas prospecting in that area. Italy is also promoting renewable energy, cogeneration and energy efficiency to reduce energy imports and the risks these imports entail.

Energy Taxes: Italy's energy taxes are high compared to most other nations. In 1995, Italy levied taxes of up to 76% on gasoline and up to 74% on fuel oil, for example.[xx] Taxes are, thus, a key element of Italy's energy policy. High energy taxes promote energy efficiency. This in turn can help reduce energy imports (improving energy security) and reduce energy-related pollution.

Economic Growth: One of the goals of Italy's energy policy is to promote economic growth and create new jobs. Italy's policy for promoting renewable energy, for example, specifically outlines how this policy will improve employment.[xxi] Job and economic growth are also some of the factors motivating Italy's efforts to reduce energy imports. Likewise, the move toward energy competition is an effort to stimulate economic growth in industry and other sectors.

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[i] *Key Energy Indicators for Italy*. IEA, Paris at http://www.iea.org.

[ii] *Bilancio di Sintesi dell'Energia Italia.* Ministero dell'Industria, del Comercio e dell'Artigianato, Direzione Generale dell'Energia e delle Risorse Minerarie, at http://mica-dgfe.casaccia.enea.it/. "Italy: Environmental Review" and "World Carbon Dioxide Emissions from the Consumption and Flaring of Fossil Fuels, 1988-1997." EIA, U.S. Department of Energy, Washington, DC.

[iii] *Verso un modello energetico sostenibile: Considerazione introduttive alla Conferenza Nazionale Energia e Ambiente.* Conferenza Nazionale Energia e Ambiente. Rome, 25-28 November 1998, pp. 85-104.

[iv] *Verso un modello energetico sostenibile: Considerazione introduttive alla Conferenza Nazionale Energia e Ambiente.* Conferenza Nazionale Energia e Ambiente. Rome, 25-28 November 1998, p. 94.

[v] Marco Carnevale, "Nuclear Decion-making in Italy," *How Western European Nuclear Policy Is Made: Deciding on the Atom*. ed. Harald Mueller. St. Martin's Press, New York, 1991, pp. 119-136; *1998 Annual Energy Review*. DGXVII, European Commission, Brussels, p. 75.

[vi] Giovanni Fraquelli and Elena Ragazzi, *Regulation of the Electric Supply Industry in Italy*. Istituto di Ricerca sull'Impresa e lo Sviluppo, Turin, 1995, p. 4-8; Giovanni Fraquelli and Davide Vannoni, *Regulation and Total Productivity Performance in Electricity: A Comparison Between Italy, Germany and France. Working Paper N. 51/1995*. Istituto di Ricerca sull'Impresa e lo Sviluppo, Turin, 1995, p. 7.

[vii] U. Farinelli and M.R. Virdis, *SENSER Country Report – Italy*. ENEA, 1996, p. 11.

[viii] Ministry of Industry, "Legislative Decree on the Electricity Market: 37 Years on, ENEL's Monopoly Comes to End," *Energy Technologies from Italy 98-99.* L'Annuario Publishing House, Nizza Monferrato, Italy, 1999, p. 79; *Attuazione della direttiva 96/92/CE recante norme comuni per il mercato interno dell'energia elettrica.* Legislative Decree 79 of 16 March 1999 published in the *Gazzetta Ufficiale* no. 75 (serie Generale) on 31 March 1999.

[ix] "La privatizzazione dell'ENI," ENI at http://www.eni.it/italiano/azioni/collocamenti/collocamenti.html; "Italy Promoting a Bigger Role for Natural Gas in its Energy Mix," *Oil and Gas Journal.* Nov. 7, 1994, p. 27.

[x] Cladio Di Macco. "L'Autorita' per l'energia ed i prezzi del gas," and Piergiorgio Berra, "L'Autorita' per l'energia e le tariffe elettriche," both in *Italia Energia 98-99.* L'Annuario, Nizza Monferrato, Italy, 1999; *Verso un modello energetico sostenibile: Considerazione introduttive alla Conferenza Nazionale Energia e Ambiente.* Conferenza Nazionale Energia e Ambiente. Rome, 25-28 November 1998, pp. 98-101.

[xi] *Documento di Programmazione Economic-Finanziaria per gli Anni 2000-2003.* Ministero del tesoro, del bilancio e della programmazione economica, e Ministero delle finanze. June 1999, Rome, p. 94.

[xii] *Libro Bianco per la valorizzazione energetica delle fonti rinnovabili.* Ministry of Industry, Commerce and Handicraft, Rome, April 1999; Minister of Industry, "Politica energetica sempre piu' condizionata dall'ambiente, ma…" *Italia Energia 98-99.* L'Annuario, Nizza Monferrato, Italy, 1999, p. 63; *Verso un modello energetico sostenibile: Considerazione introduttive alla Conferenza Nazionale Energia e*

Ambiente. Conferenza Nazionale Energia e Ambiente. Rome, 25-28 November 1998, pp. 101-102; *First Italian National Communication to the Framework Convention on Climate Change.* Ministry for the Environment, Rome, January 1995; Segreteria tecnica del Ministero *Per restare in Europa: le infrastrutture fisiche. "Le reti energetiche."* MICA at http://minindustria.it/Gabinetto/Seg_tecn/Energia/Reti_Ener.html.

[xiii] Luca Tabasso, "Addendum al Protocollo Fiat-Ministero dell'Ambiente." *Italia Energia 98-99.* Casa Editrice l'Annuario, Nizza Monferrato, Italy, p. 165.

[xiv] *Environmental Atlas: Italy.* Green Plan Center at http://www.rri.org/envatlas/europe/italy/; U. Farinelli and M.R. Virdis, *SENSER Country Report – Italy*. ENEA, 1996, p. 10.

[xv] *ENEL Research.* ENEL Research and Development Department and Public Relations and Communication Department. Rome, December 1995.

[xvi] *Bilancio di Sintesi dell'Energia Italia.* Ministero dell'Industria, del Comercio e dell'Artigianato, Direzione Generale dell'Energia e delle Risorse Minerarie at http://mica-dgfe.casaccia.enea.it/.

[xvii] Unione Petrolifera. "La Sintesi dell'attivita' petrolifera nel 1997," *Italia Energia 98-99.* L'Annuario, Nizza Monferrato, Italy, 1999, p. 19.

[xviii] *Italy*. Energy Information Agency, U.S. Department of Energy, Washington, DC, 1995 at http://www.eia.doe.gov/emeu/cabs/italy.html.

[xix] Segreteria tecnica del Ministero *Per restare in Europa: le infrastrutture fisiche. "Le reti energetiche."* MICA at http://minindustria.it/Gabinetto/Seg_tecn/Energia/Reti_Ener.html.

[xx] International Energy Agency. *Energy Prices and Taxes, Second Quarter 1995.* OECD, Paris, 1995, pp. 248-251.

[xxi] *Libro Bianco per la valorizzazione energetica delle fonti rinnovabili.* Ministry of Industry, Commerce and Handicraft, Rome, April 1999.