

# Chapter 18

## The European Policy for the Sustainability of Urban Areas and the “Covenant of Mayors” Initiative: a Case Study

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**Abstract** The “Covenant of Mayors” (CoM) is an initiative of the DG for Energy of the European Commission. It was started in 2008, with the aim of reducing Greenhouse Gases (GHGs) by 20% by 2020 through the implementation of adequate actions taken in agreement between the European Commission and the municipalities (so called signatories), which intend to adhere. The actions are identified and listed in the “Sustainable Energy Action Plan (SEAP),” which each signatory must produce within one year from adhesion and submit to the European organisms for formal approval and consequent accession to financial tools to implement them. A total of 36 (out of 61) municipalities of the province of Foggia subscribed to the above-mentioned agreement in 2010 and, 1 year later, submitted their SEAPs to the validation of the experts of the Joint Research Centre-Institute of Energy (JRC-IE) of the European Commission. All the submitted SEAPs were formally approved in July 2012. This chapter reports on the methodology the authors used for the elaboration of the SEAPs and the achieved results.

**Keywords** Covenant of Mayors · Energy policy · Greenhouse gases · Sustainable energy action plan · Urban planning

### 18.1 Introduction

The “CoM” is an initiative of the DG Energy of the European Commission started in 2008 and dedicated to the municipalities of European and extra-European countries which intend to reduce and/or contain by 2020 the energy consumption associated to the use of fossil fuels (and the GHGs as a result) by 20%. For this reason, the “Covenant of Mayors” initiative can be surely seen as a very important tool for the actual implementation of the European climate-energy policy also called the policy of 20-20-20 by 2020. In fact, municipalities can significantly contribute to achieving the above targets and to reducing the CO<sub>2</sub> by 13% in those activity sectors

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which are not considered in the EU Emission Trading System (i.e. civil, residential, transport, small and medium enterprises), since they can exert a major level of control in agreement with the Decision of the EU Commission no. 406/2009, also called “Effort Sharing” (Lumicisi 2012). The “CoM” initiative implies that the municipality taking part must produce and submit to the European Union—within one year from the signature of the agreement with the DG for Energy—a SEAP to reduce GHG emissions. This planning document must then be submitted for validation to the attention of the experts of the Joint Research Centre-Institute of Energy (JRC-IE) of the European Commission, which—in Italy—is based at Ispra. The validation allows the participating municipality to access financial tools for the actual implementation of its SEAP. This document is basically composed of two different sections: the Baseline Emission Inventory (BEI) and the strategic action plan. The first section is a typical energy balance in which the energy production and consumption in the considered municipality are estimated in terms of Megawatt per hour (MWh) together with the resulting GHGs (in particular CO<sub>2</sub> that represents the main greenhouse gas released by urban areas). This is required to be done while considering emission generating activity sectors (public, civil, tertiary, transport, and industrial) and the energy vector (electricity, natural gas, LPG, gasoline, diesel, wood, etc.). The second section describes the actions (particularly referred to sustainable mobility, public building energy efficiency, installation of renewable energy production plants, etc.) through which to decrease the GHGs computed in the BEI (Lombardi et al. 2011). In November 2012, about 4,500 municipalities (accounting for about 34% of the total European population, that is more than 170 million—out of 502 million—EU inhabitants) had signed the adhesion to the “Covenant” initiative. The member States most involved in this initiative are: Italy (with about 51% of the municipalities) and Spain (26%). They are followed by France (3.2%), Romania (2.3%), Greece (2.2%), Portugal (1.7%) etc. So far, 1,940 SEAPs have been submitted for validation, of which 482 have already been accepted and 36 have been refused. The key role of Italy in the implementation of the “CoM” initiative is clear and the number of participating municipalities will further increase in the near future. According to official Italian figures, 748 signatories submitted their SEAPs and, so far, 279 have received validation. All this has been possible also thanks to the role played by the activation of “supporting structures,” such as groups of municipalities, provincial and regional institutions (EuMayors 2012). In Southern Italy a relevant action was started in 2010 by 36 (out of 61 total) municipalities in the province of Foggia. All these—under the coordination of the Province of Foggia—signed the “Covenant” agreement with the DG for Energy in 2010 and in May 2011 submitted their respective SEAPs, which were validated and accepted by the JRC in July 2012. The production of the SEAPs was really complex and difficult due to the lack of information associated to the energy consumption and production at municipal level. The aim of this chapter is to briefly report on the methodology which was used for the SEAPs production and how this contributes to the realization of the environmental sustainability of the territory of the province of Foggia.

## 18.2 Materials and Methods

### 18.2.1 *Baseline Emission Inventory*

The production of BEI is principally based on the methodology proposed in the guidelines of the JRC of the European Union (Bertoldi et al. 2010). According to these rules it has been identified a specific year starting from which a complete and detailed set of energy consumption data could be gathered. It was chosen the year 2005 (closest to 1990—the year suggested by the EC—for which data can be collected as complete and reliable as possible) as the reference for the calculation of the needed values which only took into consideration CO<sub>2</sub> emission, and not all the GHGs, with the aim of implementing a strategy of analysis more standardized and broadly accepted. In fact worldwide 80% of GHGs are released in urban areas and 90% of these are attributable to carbon dioxide because the result of energy combustion in residential, transport and tertiary sector (IEA 2012; Dickinson and Tenorio 2011). For a better specification, the CO<sub>2</sub> emissions were computed while considering both direct (namely those deriving from fuels consumption and from electricity production within the municipalities borders) and indirect emissions (specifically those generated outside the municipalities' borders and deriving from the production of imported electricity).

This was made in accordance to what the IPPC suggests as highlighted by since it guarantees a standardized and simpler procedure (Lombardi et al. 2011; Yu et al. 2012). In addition, the analysis focused on both public and private sectors and always following the JRC guidelines. This main categories were considered: 1) buildings, tools/plants and industries; 2) transport.

For the *public* sector, a questionnaire was sent to all municipalities which had adhered to the “Covenant of Mayors” in which they were asked to give specific information about buildings (structural characteristics, energy consumption, the use of Renewable Energy Source (RES) installations), lighting, vehicle fleets (type of vehicles, year of matriculation, fuel consumption, etc.) and other initiatives in the environmental sector.

For the *agricultural, tertiary, non-ETS industry, urban transport and residential* sector, as the authors were unable to use a questionnaire because of the difficulties of data retrieval, they proceeded in estimating the energy consumption for each sector and vector. Although this could generate uncertainty in evaluating the investigated phenomena, it achieved plausible information with respect to the aims it had reach. For example, the quantity of energy, needed for heating and transport in the agricultural and non-ETS industries, was calculated by dividing the provincial consumption for each single fuel (natural gas, diesel, gasoline and LPG)—supplied by the Financial Technical Office of Foggia (Ufficio Tecnico di Finanza di Foggia (UTF) 2010, personal communication)—by the total number of workers in each sector (IPRES 2006). The average value obtained was then multiplied by the total number of those employed in each municipality. Regarding

**Table 18.1** Year energy consumption per capita by economic sectors

	Agriculture	Residential	Tertiary	Non ETS Industry <sup>c</sup>
LPG (l/capita)	None	28.34	245.80	None
Natural gas (m <sup>3</sup> /capita) <sup>a</sup>	None	338 <sup>b</sup>	1,000	6,523
Gasoline (l/capita)	482	—	—	—
Diesel (l/capita)	11,353	3.95	17.97	1,724

<sup>a</sup> Those municipalities which were not supplied with natural gas in 2005 have been excluded from the calculation

<sup>b</sup> This is the average value per resident reported for the city of Foggia by ISTAT in 2005. This parameter was preferred instead of the estimation deriving from the calculations done for diesel and LPG because the result would have been too low and unrealistic

<sup>c</sup> ETS - Emission Trading System

the agricultural sector it is evident that should be considered other GHG emissions (CH<sub>4</sub> and N<sub>2</sub>O) apart from CO<sub>2</sub>. Nevertheless, since this sector is not included in the action strategy for emissions abatement it has focused on CO<sub>2</sub> only, without considering the other gases.

In the case of the energy needed for the heating of residential and tertiary buildings, the provincial data for each single vector (LPG, diesel and natural gas)—sourced by the UTF—was reported in terms of the sum of both. Therefore, it was necessary to split this sum according to the Italian average of percentage associated to the considered type of buildings as identified by the ENEA (ENEA 2009). The obtained values were then divided by the total provincial population (residential) and by the number of workers in the tertiary sector as of 2005. The result was then multiplied by the number of inhabitants of the respective municipalities (see Table 18.1). For domestic heating, the use of forest biomass was also considered to take into account some behavioral features of some local communities. To this purpose, the information on consumption was deduced from the analysis of the authorization requests for forest cut given by the Regional Office for forest management.

The consumption of electrical energy by private individuals was deduced by the IPRES (2006) evaluation.

For urban transport, when local city data regarding the use of fuel (diesel oil, LPG, gasoline and natural gas) was unavailable from UTF, the number of different types of vehicles present in the urban area (motorcycles, cars, articulated vehicles, etc.) (Automobile Club d'Italia (ACI) 2010, personal communication) was multiplied by the average consumption and by the average yearly number of kilometers travelled (ISPRA/APAT 2010).

Once the fuel and electricity consumption per sector and energy vector were obtained, they were transformed into MWh and CO<sub>2</sub>. The European Union guidelines for conversion factors were referred to with regard to MWh, while for carbon dioxide those of the IPCC (Intergovernmental Panel on Climate Change) were used which take into consideration all CO<sub>2</sub>eq and CO<sub>2</sub> emissions deriving from fuel use (Table 18.2) (IPCC 2006).

**Table 18.2** Some energy conversion factors utilized in the considered SEAPs

Conversion factors	Natural Gas	LPG	Diesel	Gasoline	Electr.	Wood
Specific weight (kg/m <sup>3</sup> )* (kg/l)	0.800	0.600	0.832	0.734	–	–
t→MWh	13.300	13.100	11.900	12.300	–	4.300
MWh→tCO <sub>2</sub>	0.202	0.231	0.267	0.249	0.483	–
l→kWh	–	7.600	10.000	9.200	–	–
t→tep	–	1.100	1.080	1.020	–	0.371
tep→MWh	–	–	–	–	11.600	–

\* only for natural gas

## 18.2.2 Action plan

In compiling the Action Plan, the authors only considered the CO<sub>2</sub> emissions which could be reduced as a result of the implementation of interventions and policies for which the municipal governments are typically responsible. In particular, reference was made completely to the public, residential and tertiary sectors and partially to non-ETS industry (heating/cooling systems, lighting and electrical motor consumption) and transport (mobility in the urban area). Agriculture, some forms of transport (out-of-town transport) and industry (consumptions deriving from productive processes) were not counted (Città di Avigliana 2010). The objective of the Action Plan was established to be the overall reduction of 21 % of the emission of carbon dioxide, with respect to the values calculated in 2005, and that the public sector would reduce its emissions by 50%. This comes from its educational role towards its citizens and businesses and from the direct control that the administration holds over the actions anticipated by the Plan. With this aim, improvements to building insulation in conjunction with extra maintenance work, the replacement of public lighting, the purchase of ecological vehicles or of energy-saving tyres were planned. In the transport sector, a percentage of 10 % was established in encouraging citizens to change their transport habits within the local council area.

The Energy Action Plan is composed of 27 Actions divided into 6 sectors:

1. Information/Training (INFO)—INFO 01 Communication campaign for sustainable mobility, INFO 02 Covenant of Mayors online, INFO 03 Energy guardian, INFO 04 Energy desk, INFO 05 Agency for inter-council energy, INFO 06 Training sessions, INFO 07 Refresher courses for the building sector, INFO 08 School training days;
2. Public (PA)—PA 01 Urban forestation, PA 02 Green public procurement, PA 03 Regulation for building energy efficiency, PA 04 Implementation of building energy efficiency, PA 05 Energy production from renewable sources, PA 06 Public lighting, PA 07 Renewable energy purchase from private companies;
3. Residential (RES)—RES 01 Energy-saving incentives;
4. Tertiary (TER)—TER 01 Zero km Food products, TER 02 UNI-EN ISO 14001 or 16000—EMAS, TER 03 Electrical engine repowering;

5. Industrial (IND)—IND 01 UNI-EN ISO 14001—EMAS, IND 02 Electrical engine repowering; and
6. Mobility (MOB)—MOB 01 Substitution of municipality vehicle fleet; MOB 02 Substitution of tyres with ecological ones; MOB 03 Improvement of ICT services; MOB 04 Municipality wireless networks; MOB 05 Bike sharing service; MOB 06 Creation of cycle and pedestrian routes.

For each of the above-mentioned actions, an initial analysis of their economic feasibility in terms of pay-back time was carried out. At the same time, the following issues were also dealt with: a brief description of the technical actions to be implemented together with the individuals (private and public) to be involved, the expected results both in terms of economic, environmental (tCO<sub>2</sub>/year) and energy (MWh/year) savings.

### 18.3 Results and Discussion

As has already been said, the production of the SEAPs referred to 36 municipalities with a combined population of over 260,000 people (out of 640,836 people in the whole province) distributed over nearly 3,400 km<sup>2</sup> (out of a total provincial area of 6,971 km<sup>2</sup>). With the exception of Cerignola (58,827), Monte Sant'Angelo (13,250), Orta Nova (17,767), San Marco in Lamis (14,576), San Severo (55,399) and Torremaggiore (17,365), which are the most populated municipalities, the majority of the municipalities are small in size (on an average no more than 2,700 inhabitants) and are mainly concentrated in the hill and mountain areas of the province of Foggia.

As a result of the implementation of the actions listed in the SEAPs and as can be seen in Table 18.3, the yearly saving of carbon dioxide is equal to 136,195 t. The section of action which contributes the most to the reduction of the considered emissions is that of "INFO," although its contribution is difficult to actually quantify, not having available standardized procedures. In fact, it operates through propaedeutic actions which do not exert any direct impact on the emission decrease but it works mainly to increase the sensitivity and knowledge of the theme of energy efficiency, the use of renewable sources etc.. Even the section "OTHER ACTIONS" works to help the reduction of CO<sub>2</sub>. In particular, action PA07—the purchase of wind energy by private companies—appears to be one of the most important factors. The authors believe that in those areas where wind energy plants have been installed, it is possible to purchase renewable energy which has not been put into the national grid (since the national grid is not able to cope with all the energy produced) by signing ad hoc agreements with the energy producers. This could give the opportunity of retrieving energy produced at advantageous prices with consequent environmental savings. With regard to this, we have cautiously estimated a 10% reduction in consumption of energy from fossil fuel sources and a saving of carbon dioxide equal to 5,630 t/year (27% of the total). Action PA03, regarding the adoption of a Regulation for building energy efficiency, aims to promote the construction of buildings with more superior energy and environmental saving features according to what is established

**Table 18.3** Type of interventions planned in the SEAPs of the municipalities of the province of Foggia and carbon dioxide saved (tCO<sub>2</sub>)

Municipality	EE <sup>a</sup>	PL <sup>b</sup>	RES <sup>c</sup>	MOB <sup>d</sup>	INFO <sup>e</sup>	Other actions <sup>f</sup>
Accadia	29	121	0	10	679	432
Alberona	92	0	0	11	191	110
Biccari	24	114	31	18	1,331	214
Carapelle	43	127	46	126	1,873	106
Carlantino	9	0	15	9	186	25
Casalnuovo Monterotaro	12	62	50	19	213	35
Casalvecchio di Puglia	0	0	83	20	76	85
Castelluccio Valfortore	24	0	9	21	332	25
Castelnuovo della Daunia	20	0	25	13	233	503
Celenza Valfortore	43	12	36	24	498	129
Celle di San Vito	37	29	101	1	35	25
Cerignola	353	886	272	1,393	21,995	3,530
Deliceto	581	189	53	30	1,623	726
Faeto	52	91	0	18	74	90
Lesina	41	0	49	163	3,100	493
Mattinata	103	214	83	74	2,787	402
Monte Sant'Angelo	97	0	19	166	6,019	1,522
Monteleone di Puglia	66	0	0	15	246	156
Motta Montecorvino	28	75	0	19	172	215
Ortona	22	99	76	21	912	109
Orsara di Puglia	28	124	0	50	901	319
Orta Nova	127	0	76	318	6,863	759
Pietramontecorvino	44	162	77	19	631	438
Rocchetta Sant'Antonio	27	0	64	8	327	396
Roseto Valfortore	39	0	30	7	149	123
San Marco in Lamis	315	378	68	149	5,092	846
San Marco la Catola	0	0	30	8	261	21
San Paolo di Civitate	55	235	26	347	2,217	373
San Severo	516	1,679	318	4,562	26,399	5,098
Sant'Agata di Puglia	71	12	0	15	194	644
Stornara	77	204	76	39	1,596	248
Stornarella	0	237	0	97	1,601	291
Torremaggiore	0	559	0	159	5,360	964
Troia	60	214	0	47	1,793	1,215
Volturara Appula	26	13	0	13	94	72
Volturino	14	152	76	25	205	305
Total	3,075	5,990	1,790	8,033	96,260	21,047

<sup>a</sup> EE: Energy Efficiency and saving to which public building restructuring (PA04)

<sup>b</sup> PL: substitution of Public Lighting systems with new energy saving technology (PA06)

<sup>c</sup> RES: use of Renewable Energies Source like photovoltaic systems, micro wind turbines, and teleheating (PA05)

<sup>d</sup> MOB: replacement of vehicles and tires (MOB01 and MOB02), strengthening of telematic service (MOB03), development of local wireless web (MOB04), bike sharing service (MOB05) and construction of cycle and/or pedestrian route (MOB06)

<sup>e</sup> INFO: information/communication on energy saving activities of municipality

<sup>f</sup> OTHER ACTIONS: in this column different actions are collected such as incentives for energy efficiency (RES), urban forestation (PA01), regulation for building energy efficiency, (PA03), purchase of renewable energy from private companies (PA07) action on TERTIary (TER) and action on INDustrial sector (IND)



by more recent European and national laws. This action results in a large reduction of CO<sub>2</sub>, with an environmental saving of about 6,228 tCO<sub>2</sub>/year (about 30% of the total sector). The emissions in the “MOB” section are quantitatively less relevant because they derive mainly from the increased request for the substitution of the old municipality vehicles with newer and more environmentally-friendly ones. The greatest contribution was given by the implementation of a bike sharing service (in the municipalities of San Severo and San Paolo di Civitate) and the construction of a cycle-pedestrian route of 1.5 km in the municipality of Carapelle. These actions brought about a 50% reduction in carbon dioxide emissions in the entire section.

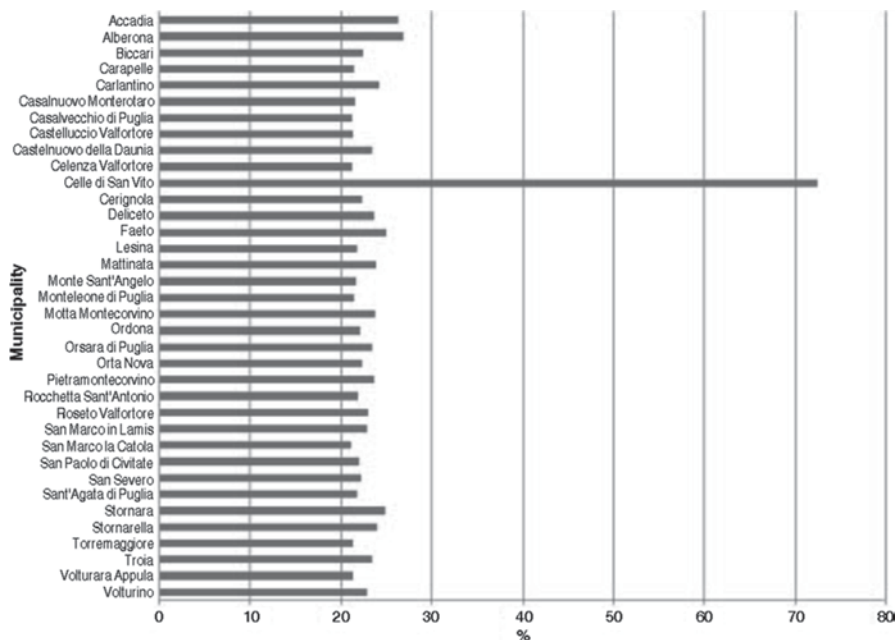
The “PL” section mainly refers to the substitution of mercury light bulbs with high pressure sodium light bulbs, also including the implementation of light flow regulators. We thought to avoid installing LED lighting due to the high cost of their purchase and maintenance. The resulting environmental saving is equal to about 6,000 t/year. The “EE” mainly refers to the renovation and/or substitution of old parts, such as the external insulation of a house (walls and roof insulation), the installation of new and energy-efficient windows and doors, the installation of new and energy-efficient heating systems (e.g., implementation of thermal convection or application of thermostatic valves), thermal regulation in buildings, etc.. Out of a total of 489 buildings, 142 are those to be subject to these kind of interventions. The resulting reduction of carbon dioxide levels is estimated to be more than 3,000 t/year. The actions referring to the implementation of renewable energy plants, regards the installation of wind and photovoltaic micro-plants. In addition, the installation of three biomass cogeneration power plants was considered for the municipalities of Celle di San Vito, Orsara di Puglia and Pietramontecorvino. The environmental saving deriving from these type of actions was computed to about 200 t/year.

The following graph (Fig. 18.1) highlights the percentage of CO<sub>2</sub> abatement—or, in other terms, the environmental saving—for each single municipality as the result of the implementation of the actions identified in the SEAPs. It is evident how the majority of the municipalities overtake the minimum target of reducing the GHG emissions which is fixed at 21%. The most impressive case is that of Celle San Vito, whose environmental saving stands at 72% with respect to the situation observed at 2005. This situation is the result of the planned implementation of a cogeneration plant fed with biomass for teleheating and whose power is sufficient to guarantee the provision of heat and renewable energy for the whole local population (about 150 inhabitants).

## 18.4 Conclusions

The aim of the “CoM” initiative is to promote the active participation of municipalities and their populations in the identification and implementation of sustainable development models at the local scale. In other words, the “CoM” initiative intends to achieve significant levels in the delocalization of energy and environ-





**Fig. 18.1** Percentage of CO<sub>2</sub> abatement for each single municipality as the result of the implementation of the actions identified in the SEAPs

mental policy decisions. In this context, the experience matured by the province of Foggia (Italy)—a territory in Southern Europe where the environmental sustainability management of the urban areas is still far away from a concrete and effective execution—is a virtuous example of a strong commitment towards the implementation of the environmental and energy guidelines of the European Commission. As highlighted in the chapter, various technical difficulties were met while producing the SEAPs. Most of these difficulties were associated to the lack of adequate data per activity sector and energy vector at municipal level. In addition, one of the main features of the majority of the considered municipalities is the small size and low level of industrialization. For this reason, it was often necessary to re-adapt and modify the indications supplied by the JRC-IE. Nevertheless, the SEAPs were produced and submitted within the given deadlines and have all been accepted by the European Commission, and they are now waiting for the financial resources to implement the actions planned. With regard to the financial aspect, a final consideration should be made while stressing the necessity to align the implementation of the SEAPs with regional funding. At the time of writing, in fact, there is still a wide gap between the European policy indication associated to the implementation of the “Covenant” initiative and the way in which—especially the regions categorized as convergence areas—have planned to use the funds they receive from the European Union. Solving this problem could represent an accelerator in the implementation of the SEAPs and one more step in the right direction to pursue the energy and environmental sustainability of the considered local territories.

## References

- Bertoldi P, Bornàs Cayuela D, Monni S, de Raveschoot RP (2010) Guidebook: “how to develop a sustainable energy action plan (SEAP).” Joint Research Centre Scientific and Technical Reports, Publications Office of the European Union, Luxembourg. <http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/14204/1/com%20guidebook%20jrc%20format.pdf>. Accessed 25 Oct 2012
- Città di Avigliana (2010) Piano di Azione sull’energia - Avigliana in transizione, aprile 2010. <http://www.comune.avigliana.to.it>. Accessed 18 Oct 2012
- Dickinson J, Tenorio A (2011) Inventory of New York City greenhouse gas emissions. Mayor’s Office of Long-Term Planning and Sustainability, New York. [http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/greenhousegas\\_2011.pdf](http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/greenhousegas_2011.pdf). Accessed 31 Jan 2012
- ENEA (2009) Rapporto energia e ambiente 2007-2008 I dati - Statistiche energetiche e ambientali - Distribuzione dei consumi energetici del civile tra terziario e residenziale per fonte energetica. <http://www.enea.it>. Accessed 1 Nov 2012
- EuMayors.eu (2012) Covenant in figure. [http://www.covenantofmayors.eu/about/covenant-in-figures\\_en.html](http://www.covenantofmayors.eu/about/covenant-in-figures_en.html). Accessed 14 Nov 2012
- Intergovernmental Panel on Climate Change (IPCC) (2006) 2006 IPCC Guidelines for national greenhouse gas inventories. In: Eggleston S, Buendia L, Miwa K, Ngara T, Tanabe K (eds) Institute for Global Environmental Strategies (IGES), Hayama, Japan. <http://www.ipcc-nggip.iges.or.jp>. Accessed 3 Nov 2012
- International Energy Agency (IEA) (2012) World Energy Outlook 2011. <http://www.worldenergy-outlook.org>. Accessed 31 Jan 2012
- ISPRA/APAT (2010) Capitolo 3- Trasporti, in *Annuario dei dati ambientali 2009*. Edizioni Ispra Roma. <http://www.isprambiente.gov.it/files/pubblicazioni/rapporti/annuario-2009/3-trasporti.pdf>. Accessed 11 Oct 2012
- Istituto Pugliese di Ricerche Economiche e Sociali (IPRES) (2006) *La Puglia in cifre*. In: Ruzzo M. Sedit srl, Bari
- Lombardi M, Rana R, Tricase C (2011) Per la sostenibilità ambientale delle città. In: Campisi B, Novelli V *Contribution of Commodity Science to a Sustainable World - Proceedings of the 25th Italian Congress of Commodity Science*, FORUM, Edizioni, Udine (Italy)
- Lumicisi A (2012) Il Patto dei Sindaci: un progetto di sviluppo sostenibile per le città d’Europa. Proceedings of the conference “Il Patto dei Sindaci: uno strumento per la città sostenibile,” Soveria Mannelli (Italy), 12 June 2012. <http://www.energiacalabria.org/lumicisi.pdf>. Accessed 1 Nov 2012
- Yu W, Pagani R, Huang L (2012) CO<sub>2</sub> emission inventories for Chinese cities in highly urbanized areas compared with European cities. *Energy Policy* 47:298–308