



Association européenne pour la Biomasse

European Biomass Association

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Report to project Key Issues for Renewable Heat in Europe - K4RES-H

Regulations for BioHeat

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1. Regulations for bioheat in Europe	2
2. Case studies.....	7
2.1. France – Wood Fuel Programme	7
2.2. Italy - The Italian National Program on Renewable Energy from Biomass	13
2.3. Italy - Regional energy and environmental plans	17
2.4. Slovenia – Public tender for diversification in agriculture	21
2.5. Germany – Federal Building Code and Land Utilisation Ordinance.....	24
2.6. Sweden – Permit procedure	28
2.7. Germany – Energy Saving Ordinance	29
2.8. Slovenia - Decree on marginal emission values from large boilers.....	36
2.9. Sweden - Landfill legislation	41

1. Regulations for bioheat in Europe

This report presents nine regulations that have an impact on bioheat development. These regulations have different background but can be roughly classified into the following classes :

Plans for bioheat development

- 1. FR - Wood Fuel Programme
- 2. IT - The Italian National Program on Renewable Energy from Biomass
- 3. IT - Regional energy and environmental plans
- 4. SI - Public tender for diversification in agriculture

Rules for permits

- 5. DE - Federal Building Code and Federal Land Utilisation Ordinance
- 6. SE - Permit procedure

Others

- 7. DE - Energy Saving Ordinance
- 8. SI - Decree on marginal emission values from large boilers
- 9. SE - Landfill legislation

Some regulations have a positive impact while others are limiting the bioheat development and create barriers to implementation (like regulations 5 and 6).

The regulations are summarized below and explained in more details within the next chapter.

1. France - Wood Fuel Programme

The French Wood Fuel Programme 2000 - 2006 aims at developing wood energy at industrial and district heating levels. In addition a certification system is implemented for domestic heating systems. It is initiated by the French Government, Department of Industry, Environment and Regional Planning, and managed by the agency ADEME.

The programme is a follow up of a previous plan (1993-1999), enlarged to all France territory and better targeted to collective and industrial heat. It also aims at increasing the efficiency in domestic wood heating sector. Objectives are manifold : 600 additional collective boilers, 400 additional industrial boilers, certification of domestic equipments, improvement of 10% of energetic performances, create 2000 new jobs, improve energy balance by 270 ktoe and decrease greenhouse gas emissions by 80 kt per year.

The programme is linked to financial provisions for subsidies to investment, R&D and emission monitoring for boiler technologies, nationwide agreement among stakeholders, etc.

Four years after the start of the programme 1090 boilers have been installed (objective reached) and the amount of energy reached 73% of the objective.

2. Italy - The Italian National Program on Renewable Energy from Biomass

The Italian National Program on Renewable Energy from Biomass (PNERB) was issued in 1998 with the objective of replacing 8 – 10 Mtoe fossil fuels by bioenergy. It was initiated by the Ministry of Agricultural and Forest Policy.

The PNERB covers energy crops for liquid biofuels, biomass from agriculture and forestry for thermal and electric energy, and accompanying measures (agreements between state and regional authorities). Outstanding actions were carried out with the Lombardi region (biomass for energy and transport, district heating), with the Abruzzo region (biomass pilot project) and through the National Programme on Biofuels (PROBIO, demonstration and dissemination of liquid biofuels).

PNERB has financed, through the Italian regions 29 demonstration projects. The programme offered good opportunities for collaboration between the central government, local administrations and entrepreneurs. Flexibility and non bureaucratic procedures are key factors to reach concrete achievements.

3. Italy - Regional energy and environmental plans

The regional energy and environmental plans (PEAR) are part of the competence of Italian regions (19) and provinces (2) that have to manage their own energy and environmental plans. These plans consider scenarios for energy sources and demand, with various emphasis on renewable energy sources depending on the region. Environmental aspects and greenhouse gas reduction are also considered.

The plans influence the authorisation to private and public initiatives in the bioenergy sector as, for example, they identify possible district heating and large energy plants sites, plan the support to energy production facilities, estimate the availability of biomass.

Projects Financing is provided by national sources and by the Structural Funds of the EU that have priorities according to areas; Objective 1 (Southern Italy), Objectives 2 and 3 (Central and Northern Italy). However the emphasis on bioenergy is not even among the Regions. Afforestation for production and carbon absorption gets better acceptance than energy crops on cultivated land.

Communication of the plans is carried out through the local agencies that are organising conferences.

PEARs can be considered as successful regulations thanks to their approach to bioenergy, and links between energy and environment. In the north of Italy lots of district heating plants have been installed and are now in operation.

4. Slovenia - Public tender for diversification of agricultural

In Slovenia the second public tender for diversification of agricultural and other agricultural related activities has been launched with a deadline in May 2006. The initiator

is the Agency for Agricultural Markets and Rural Development (AAMRD) that depends on the Ministry of Agriculture, Forestry and Food.

The tender is open for farmers, farmer associations, individuals and companies working on farm. Eligible projects should deal particularly with diversification in agriculture, improved efficiency of work, employment, increased income, countryside development, on farm tourism and, building and equipment for biomass energy plants.

The budget of this call amounted to 3,5 M€, half from EU funds (EKUJS), half from Slovenian co-financing.

It is too early to know about the approved projects but 63 were submitted (only !), out of which 24 on bioenergy. This small amount of projects might be explained by the short time between the announcement of the call and the deadline and the bad advertisement of it.

5. Germany - Federal Building Code (BauGB) and Federal Land Utilisation Ordinance (BauNVO)

The Federal Building Code (BauGB) and Federal Land Utilisation Ordinance (BauNVO) (and their ordinances) are regulating the land use and are used for communal development, including decisions concerning biomass cogeneration (CHP) plants.

These regulations take the public interest and several aspects like transportation, environment, and population into account but are neglecting the economic feasibility and specific requirements of biomass CHP plants.

The 17th Federal Immission Control Ordinance requires that waste wood energy plants use the same filter technologies as waste incineration plants. Biomass facilities are assimilated with the bad reputation of incineration plants and are facing difficulties in public acceptance. Interpretation of the legislation is also creating problem when dealing with the acceptance or not of biomass plants in demarcated areas close to heat consumers. Getting permits in outlying areas is a barrier to the efficient and economic use of heat because of the lack of neighbouring heat consumers.

Even if the emphasise of environmental and public matters is quite important to steer the development in a sustainable way, many certification and bureaucratic survey requirements exceed the necessary and result into time loss and extra costs for the investor.

6. Sweden - Permit procedure

Bioenergy is environmentally desirable at global level but may lead to noise, traffic and emissions at local level. To build and operate combustion units of 0,5-10 MW, permits from the community is needed, according to the Planning- and building law and according to environmental issues. For units of more than 10 MW, a permit following the Environment laws regulation about hazardous operations and health protection is required.

The regulation is managed by the National Environment Protection Board for general recommendations (from units smaller than 0,5 MW) and local communities are responsible for the 0,5-10 MW range.

The overall objective of environmental protection of this regulation is meaningful, as it improves the environmental impact of the plants. However some investments are delayed due to the procedure and this can be considered as a cost for the society.

7. Germany - Energy Saving Ordinance

The Energy Saving Ordinance (EnEV) aims at reducing the energy demand in new building by 30% as this sector is the third source of CO₂ emissions. Primary energy demand of building is addressed and renewable energies are supported, through an integrated approach (building, engineering). Renewables are not mandatory but an option among others.

The Ordinance was initiated by the Federal Ministry for Transport, Building and Urban Development and the Federal Ministry of Economics.

EnEV prescribes a calculation of the energy and heat demand. "Energy Pass" will be needed and it will become mandatory for new buildings. The regulation takes into account the primary energy demand (whole cycle approach) and the efficiency of the heating systems. However if a building is heating with at least 70% wood in an automatic heating installation, it does not have to certify the primary energy demand. Other provisions are mentioned for insulation, size of the building, etc.

This regulation will lead to a quicker replacement of old central heating systems (500 000 systems to be replaced by end 2006) and bioheat applications will get a percentage of this market (currently 1 to 2% of new boilers are pellets boilers). However the EnEV is not linked to any financial incentives.

A mandatory percentage of renewables, for example 5 or 10%, is now considered as amendment to the EnEV. However bioheat applications are suited as main heating systems and this obligation is not likely to influence the bioheat market significantly.

8. Slovenia - Decree on marginal emission values from large boilers

A decree on emission values from boilers came in force in August 2005 for emissions of SO₂, NO₂, CO and dust for boilers. It was initiated by the Slovenian Ministry of Environment and Spatial Planning that would like to adjust the Slovenian regulation to EU standards.

Boilers are classified according to type of fuels (solid, liquid or gas) and size, and emission thresholds were determined. The regulation aims at improving the emissions, increasing the use of harmless fuels for environment and upgrading the old large boilers to new standards.

The regulation offers the advantage of simplification in the classification of boilers (as compared with the previous regulation), clearer emission limits and effective monitoring.

This decree comes in parallel with the “Programme for the Wood Biomass Use for Energetic Purposes in Slovenia, 2001-2004” that plans for 2010 the construction of 50 large boilers (~ 3 MWth, district heating and industrial ones), 100 medium scale boilers (~ 300 kWth) and 5000 small boilers (~ 30 kWth). This plan would help to increase renewable heat in Slovenia from 22% in 2002 up to 25% in 2010.

9. Sweden - Landfill legislation

Since 2002 it is prohibited to deposit assorted combustible waste in Sweden. Since 1 January 2005 it is also prohibited to deposit other organic waste. These prohibitions give incentives to increase the utilization of waste for reuse, recycling and energy production in order to minimize the amount of deposited organic waste.

The regulation was initiated by the Swedish Ministry of Sustainable Development, based particularly on the European directive on waste landfilling (1999/31/EC) that states maximum percentages of biodegradable municipal waste that can be landfilled by the years 2006, 2009 and 2016.

The regulation makes sense to reduce useful waste and apply the hierarchy solutions : re-use, recycle, energy and finally deposition. A report by RVF has shown that 72% (by weight) of the considered waste is renewable, 14% is fossil and 14% non combustible. A CO₂ emission factor of 25 g/MJ fuel has been determined.

The regulation leads to an increase availability of fuels for bioenergy and many communities have build dedicated heating plants for solving both the waste materials constraint and heat demand through district heating (often also power production). The existence of district heating is a key element to ensure an efficient use of wastes that are preferably burned in large scale units with appropriate flue gas cleaning.

It should be noted that waste are not eligible for green certificates in Sweden, what leads to less incentives for electricity production and allotment of certificates for some plants.

2. Case studies

2.1. France – Wood Fuel Programme

I. IDENTIFICATION OF THE REGULATION

1 - Title of the regulation

The wood fuel program 2000/2006

2 - Brief description of the regulation

The wood fuel program was launched by ADEME with the aim of developing industrial and district heating by encouraging the rational utilization of wood and wood wastes, and launching of a development and certification system for high-performance clean wood domestic heating systems. With this plan ADEME aims to guide and facilitate technical and economic development in the field of wood fuel, notably by reducing their costs. Implementing a strategy of providing support for businesses, it will endeavor to assist the penetration of renewable source-based techniques into the most easily accessible and the most profitable markets.

3 - Promoter

Department of the State Secretary of Industry (*Secrétariat d'Etat à l'Industrie; SEI*)

Implemented by ADEME (the French Agency for Environment and Energy Management)

4 - Type of actor involved

Authorities enacting the regulation :

- National Government [Department of the State Secretary of Industry (*Secrétariat d'Etat à l'Industrie; SEI*), the Ministry of Environment and Regional Planning (*Ministère de l'Environnement et de l'Aménagement du Territoire; MATE*)]

Authorities administering the regulation:

- ADEME

Authorities administering the investment subsidy :

- ADEME (selection on energetic efficiency by euro/tep ratio)
- Others publics subsidies: regions, departments, Europe (FEDER, FEOGA)
- FOGIME : guaranty fund for loans concerning investment in rational use of energy
- FIDEME: investment fund to support companies involved in rational use of energy projects
- FCPR 3E (Emertec Energie Environnement) : risk capital fund for innovative companies in energy/environment fields.

Actors Targeted:

- Equipment Suppliers
- Wood fuel Suppliers
- Distribution
- Energy agencies and consulting institutions
- Architects and planning bureaus
- Manufacturing industry
- Consumer / building owner

5 - Regulations priorities

The regulation priorities are developing industrial and district heating by encouraging the rational utilization of wood and launching of a development and certification system for high-performance clean wood domestic heating systems.

Priorities for 2000/2006:

- Extension and amplification of the energy wood plan (launched in 1995 in 13 departments or regions) in all regions
- Facilitation of the use of non-recyclable waste wood for energy production in the wood and paper industries
- Launch of a development and approval system for high-performance clean wood domestic heating
- Experimental research in cogeneration-gasification with wood
- Structuring of supply
- Contribution to the replanting of forests damaged by the 1999 storm
- Local job creation

II - DESCRIPTION OF THE REGULATION

6 - General description of the regulation

a) Background

Wood fuel was and continues to be supported under the following programmes:

1995-1999: Le Programme Bois Energie et Développement Local (PBEDL). It was restricted to 11 regions (13 departments) and concentrated on the promotion of collective and industrial heating purposes, support wood supply companies. Main achievements at the end of 1999 were 190 wood boilers installed for collective heating and 130 wood boilers for industrial heating (210 local job creations). The wood fuel market in France was one of the more successful examples of exploitation of renewable energy sources in the country over this past decade (1990-1999), with wood fuel used mostly for heating apartment blocks.

2000-2006: le programme Bois Energie (PEB) (Wood Fuel Program) saw the scope extend from just 11 regions to all areas. With the aim of :

- Reinforcement of the promotion of collective/industrial heating purposes (1000 woods plants)
- Integration of a domestic wood heating : certification, raising awareness, promotion of best practices, communication.
- Financial support for collective/industrial plants

Key figures : Wood energy at the start of 2000

	<i>Current market trend</i>	<i>Current level of equipment</i>
Domestic heating	over 8 mtoe/year static	Mediocre (7 million units)
Heating for collective/tertiary building sector	150,000 toe/year increasing	Good (recent) (400 boilers)
Energy production for industrial process	≈ 0.7 mtoe/year increasing	Highly variable (1,000 boilers)

(source : ADEME)

b) Design of the regulation (mechanism) and management of its implementation

Energy policy falls within the jurisdiction of the Department of the State Secretary of Industry (SEI). In the case of renewable energies and rational energy use, the policy is defined by the SEI and implemented by ADEME (the French Agency for Environment and Energy Management). The fight against climatic change falls within the jurisdiction of the Ministry of Environment and Regional Planning (MATE). Therefore both these Ministries collaborated on the French National Plan for Improved Energy Efficiency (PNAEE) whose aim is to ensure the conformity of national energy policy with the climate change mitigation policy.

ADEME programs within the framework of the PNAEE were devised to be in line with France's National Plan to Combat Climatic Change and with the French national targets in the European directive for renewable energy sources. The wood fuel program 2000/2006 is one of ADEME programs.

c) Objective of the regulation

General objective :

The general objective of the regulation is developing industrial and district heating by encouraging the rational utilization of wood and launching of a development and certification system for high-performance clean wood domestic heating systems.

- To bring the collective/tertiary building and industrial heating sector to commercial maturity in 2006, making it sufficiently competitive to permit sustained independent development.
- Requalify the range and the market for domestic wood burning heating systems; structure distribution networks for guaranteed efficient fuel wood
- Contribute to France's target of renewable energy source in European objectives.

Objectives for 2000/2006:

- Extension and amplification of the energy wood plan (launched in 1995 in 13 departments or regions) in all regions
- Facilitation of the use of non-recyclable waste wood for energy production in the wood and paper industries
- Launch of a development and approval system for high-performance clean wood domestic heating
- Experimental research in cogeneration-gasification with wood
- Structuring of supply
- Contribution to the replanting of forests damaged by the 1999 storm
- Local job creation

Results Forecast for 2006 :

There are 3 levels of objectives:

Business sector (1st circle):

Multi-dwelling, institutional and industrial building:

Allocation: consultancy for 250 projects and implementation of 80 territorial studies (market, supply, range of equipment)

The objective for 2006 is to put an additional 1,000 boilers, with 600 for collective heating and 400 for industry, including 20 large-scale projects for industry

- + 300 ktoe/year of extra substitutes in 2006 (120 ktoe/year for the collective and 180 ktoe/year for the industrial sector)
- + 1000 MW operational (350 MW for collective sector and 650 MW for industrial sector)
- + 620 kt/year of emissions avoided in 2006

Domestic sector:

- Promotion of domestic wood use (certification of equipment, turnkey solutions, wood distribution network ranking, and so on)
- Keep the domestic heating consummation over 8Mteo/year
- Improvement of 10 % the energetic performance and environment efficiency

2nd circle impact:

- + 2,000 extra jobs created

3rd circle impact

Improvement of 4% on the sector's (closed heaters) energy and environmental balance sheet that is:

- + 270,000 toe/year saved in 2006
- + 80 kt/year of emissions avoided in 2006

In total: + 570 ktoe/year fossil fuel substitution in 2006, for 700 kt/year of emissions avoided.

7- Actions

- Financial support for decision-makers.
- Subsidies for investment in collective/tertiary and industrial sectors.
- R&D and emissions monitoring for combustion technologies, boilers and domestic systems.
- In-depth market studies, wood supply and distribution networks, and criteria of operation for fuel reserves, notably in forests.
- Nationwide agreement to be established with concerned professionals to ensure the reliability of equipment and fuel wood supplies (public buildings sector), and distribution (domestic sector).
- Establishment of contracts for the involvement of regional authorities in the energy wood program, promotional drives and assistance with studies and investments within the framework of regional energy service branches.
- Pricing of electricity from renewable sources, pricing for electricity from wood fuel: 0.049 euros/kWh during 15 years + premium for energy efficiency < 0.012 euros/kWh

8 - Timing

The wood fuel program 2000/2006 came into force in 2000.

9 10 - Costs of implementing the regulation (costs on the side of the administration and on the side of the investor) - Finances

ADEME and the regions should make a financial support of 15 M€/year in this plan:

- By subsidies for investment for a maximum of 40%
- By certification, raising awareness, promotion of best practices, communication
- Structuring of supply

III RESULTS of the regulation

11 -Quantitative results

Main achievements at the end of 2001 are 278 wood boilers installed for a total contribution of 39.421 toe/yr launching the Flamme Vert Label (boilers for individual dwellings).

At the end of 2003, 522 new wood boilers installed for collective heating and 240 wood boilers for industrial heating since the beginning of the program. The total investment was 218 m€ with 37M€ from ADEME.

Comparison of objectives and achievements of the Wood Energy Plan

Type of boiler		Objectives for The wood fuel program 2000/2006 (7 years)	Realization during 2000/2003 (4 years)
Collective heating	Number of boilers	600	522
	Capacity (MW)	350	202
	Consummation (toe)	120,000	70700
Industrial heating	Number of boilers	400	240
	Capacity (MW)	650	376
	Consummation (toe)	180,000	103,840
Total	Number of boilers	1000	762
	Capacity (MW)	1000	578
	Consummation (toe)	300,000	178,540

At the end of 2004, 1090 boiler plants, the objective in terms of the number of boiler plants has been reached. In terms of energy produced 73% of the objective has been reached. For the years 2005 and 2006, 80,000 toe stayed to be saved.

12 - Replication potential

13 - Communication

ADEME local agencies, web site, conferences...

IV MONITORING & LESSONS LEARNED

Monitoring

Analysis and lessons learned

Political : Support for biomass energy through the wood fuel and local development plan. This plan covers both the development of the wood fuel supply sector and the installation of new wood fired-boilers.

Financial : Support provided towards the development of projects. Support for the development of district heating plants is available in the form of investment subsidies from ADEME, region, and national funds. French policy is to promote renewable energies when they are competitive, or close to being competitive.

2.2. Italy - The Italian National Program on Renewable Energy from Biomass

I - Identification

1. Title

PNERB: The Italian National Program on Renewable Energy from Biomass.

2. Description

PNERB was the first Italian document, issued in 1998, setting guidelines for bioenergy deployment. The target is to replace, within 2012, 8-10 Mtoe of fossil fuels with biomass coming from agriculture, forestry, livestock sectors and related industries.

3. Promoter

- Ministry of Agricultural and Forestal Policy

4. Actors

- Regions
- Provinces
- Biomass stakeholders
- Agriculture organisations

5. Regulations priorities

- Energy crops cultivation for biodiesel and bioethanol production and their use in the transportation and household heating sectors.
- Thermal and electric energy production from biomass recovered from agriculture, forestry, and livestock sectors.
- Measures for fostering non-food agriculture practices for biofuels production.
- Carbon uptake by new forestry plantations
- Voluntary agreements between public administrations and economic operators in the agriculture and agro-industry undertakings for bioenergy deployment.

II - Description

6. General description

a) Background

In the last decade Italian energy policy promoted an increasing use of bioenergy. The main objectives of bioenergy development programmes aimed at fulfilling the commitment assumed in the Kyoto Protocol, to reduce CO₂ emissions by a factor of 6,5% with respect the emission of 1990. A total amount of about 100 Mt CO₂ need to be suppressed within 2010-2012. The contribution of biomass energy is expected to be in the order of 10-15%

b) Design/management

Memoranda of understanding between State and Regional Authorities, directives, and action plans are the main tools for implementing the Program. Management is performed through committees appointed by the Ministry of Agriculture and Forestry Policy.

c) Objective

The objectives are multiform and approached in a holistic way.

- Energy: Recovery of residual biomass and waste for energy production, developed of innovative energy conversion technologies.
- Agriculture: Expanding the land areas for energy crops cultivation, reaching 200,000-300,000 ha in a 5 years time-frame.
- Forestry: Improving the forestry management for carbon sequestration and for multiplying modern forestry enterprises.
- Environment: Soil restoration, land protection and greenhouse gas reduction.
- Human health: Mitigation of the pollution effects of urban traffic and household heating.
- Socio economic: Cost reduction of bioenergy products, reduction of unemployment, new jobs creation, expanding environmental and renewable energy awareness.

7. Actions

Following the PNERB, subsequent collateral programmes and action plans were set up especially concerned bioelectricity and liquid biofuels for transport. Remarkable actions for the heat sector are:

1. The Agreement on energy and the environment signed by the Lombardy Region and the Ministry for the Environment and Ministry of Treasury (Action 1). This agreement includes a series of initiatives - financed jointly by the signatories - aimed at the production of energy with a low environmental impact; the use of biomass for energy and transports; extensive actions in the reclamation of polluted areas and the recovery of risk areas; the diffusion of district heating etc.
2. The Agreement between Ministry for the Environment and the Abruzzo Region (Action 2), whose scope is to set up a pilot project for the valorisation of biomass, leading to the definition of guidelines for the reproducibility of the project on the regional scale.
3. The National Programme on Biofuels (PROBIO) approved by the inter -ministerial Committee for the Economic Planning (CIPE) in February 2000 and managed by the Ministry for Agriculture and Forestry Policy (Action 3). The programme promotes demonstration projects and dissemination activities at Regional and Interregional level with a strong link with territory in order to local administrations, industrial and agricultural entrepreneurs towards biofuel development.

8. Timing

PNERB came into force on June 24th, 1998

- Action 1: 2001 →
- Action 2: 2004- 2006
- Action 3: 1999 →

9. Cost of implementing regulation

- Action 1: 1 Billion euro
- Action 2: The Program is 50% financed by the Ministry for the Environment, and the remainder by the Abruzzo Region, to a total of 10 million Euros.
- Action 3: The financial support of PROBIO was $2,6 \times 10^6$ € per year.

10 Finances

The funds have been provided by:

- State
- Regions
- EU
- Private Co.

III - Results of the regulation

11. Quantitative results

Managed by Italian Regions, the program has financed, up to now 29 demonstrative regional and inter-regional bioenergy projects for a total cost of M€12.

The majority of financed projects (19 projects) regards heat production in the household and agricultural sectors, by mean of lingo-cellulosic biomass.

The eligible project costs include both the capex , the monitoring , the data elaboration and the dissemination costs.

12. Replication potential

The agreements between state and local authorities (PROBIO, Memorandum of Understanding, etc) are models which may be replicated and also implemented in other EU Countries.

13 Communication

The "Gazzetta Ufficiale" (G.U.) is the official bulletin for communicating Parliament Acts, as well as Government Decrees and Directives. Periodic evaluation meeting between Ministry and Regions. Press campaign is also used for this purpose.

IV Monitoring and lesson learned

Monitoring

The Ministry of Agriculture and Forestry Policy has charged one of its scientific institute (ISNP) to monitor the results so far achieved, (in co-operation with ITABIA as far as PROBIO is concerned).

Analysis and lesson learned

The actions of point 7 have provided a powerful tool for bringing together different types of stakeholders:

- Central Government, with the function of stimulating, with a minimum financing contribution , regional and territorial projects;
- Local (regional and provincial) Administrations, with the task of defining and coordinating regional and interregional projects;

- Entrepreneurs from the agriculture, forestry and industrial sectors which implement locally the projects.

However the proper functioning of the whole system requires a flexible and non-bureaucratic operative organisation.

Effects of existing regulations

Greater awareness, among different stakeholders, of the role of biomass in the Renewable Energy Sources system has been experiencing. Lots of initiatives both from supply and demand sides have been undertaken leading to the following present situation concerning the contribution of bioenergy to the global national energy balance:

Accessible biomass potential (excluding energy crops and including MSW): 13-15 Mtoe

Target 2010-2012: 8-10 Mtoe

Present situation (2003-2004) : table below

	<i>Mtoe</i>	<i>% of total bioenergy</i>	<i>% of global national consumption</i>	<i>Energy from RES (Mtoe)</i>	<i>% BIO/RES</i>
<i>Primary Bioenergy</i>	<i>5.12</i>	<i>100</i>	<i>2.7</i>	<i>15</i>	<i>34</i>
<i>Bioheat</i>	<i>3.94</i>	<i>77</i>	<i>9</i>	<i>5</i>	<i>79</i>
<i>Bioelectricity</i>	<i>1</i>	<i>19.5</i>	<i>1.3</i>	<i>10</i>	<i>10</i>
<i>Biofuels</i>	<i>0.18</i>	<i>3.5</i>	<i>0.5</i>		

2.3. Italy - Regional energy and environmental plans

I - Identification

1. Title

PEAR: Regional energy and environmental plans

2. Description

In recent years many State's tasks have been transferred from the State to the Regions and Provinces. The latter have the commitment, among other things, to define and implement their own energy and environmental plans, becoming the main reference point for anyone who intends to invest in these sectors.

3. Promoter

19 Regions and the two Autonomous Provinces

4. Actors

- Municipalities,
- Consumers associations,
- Industries,
- Energy service providers,
- Forest-based industries and co-operatives, etc.

5. Regulations priorities

Each PEAR has placed a different emphasis on renewable energy sources and biomass. Even the financial contribution was evaluated using heterogeneous criteria.

A considerable portion of the Plans is dedicated to outlining short and medium-term scenarios for the energy demand of each of the sectors, as well as for energy sources, based on hypothetical economic development and technological trends and choices. This is followed by the identification of the key instruments for the implementation of the plans. Objectives of reduction greenhouse gas emission on regional level are also considered.

II - Description

6. General description

a) Background

The Plans generally consist of an analytical part, which gathers information on the Region's energy market both in terms of supply (existing plants, production, importing, conversion, etc.) and demand. Information on environmental situation is also provided. This part is followed by a comprehensive evaluation of the potential of RES that may contribute to the demand, in addition to or in place of traditional energy resources. Details of actions to be pursued integrate the analytical part of the PEAR.

b) Design/management

Regional Departments (Energy, Agriculture, Environment Assessors) have the tasks to plan and authorise public and private initiatives in such a way to guarantee the agreement of the initiative to the plan

c) Objective

Use agricultural and agro-food industry residues, livestock sludge, wood and forest residues and energy crops for household heating, district heating and cogeneration.

7. Actions

- Drafting a regional energy balance;
- Identification of energy fields;
- Identification of possible district heating sites;
- Financial plan to support energy production initiatives;
- Formulation of objectives based on action priority;
- Formulation of procedures for identifying possible sites for large-size plants (up to 10 MW);
- Partnerships in private investments through regional agencies;
- Organisation of seminars, exhibitions, conferences for sensitising local population.

8. Timing (*updated to 2004*)

Timing of the PEAR plans

Region	Status of the PEAR	Timing
Abruzzo	In force	Approved by D.G.R. n.1189 del 5/12/01
Basilicata	In force	Approved by D.C.R.n. 220 del 26/06/01
Calabria	To be approved	
Campania	To be approved	
Emilia Romagna	To be approved	Draft B.U.R. n. 221 del 16/01/03.
Friuli V. G.	To be completed	
Lazio	In force	Approved by D.C.R. n.45 del 14/02/01.
Liguria	In force	Approved by D.C.R. n.43 del 2/12/03
Lombardia	In force	Approved by D.G.R. n.12467 del 21/3/03
Marche	To be approved	
Molise	To be completed	
Piemonte	In force	Approved by D.C.R.n.3513642 3/02/04
Puglia	To be completed	

Sardegna	In force	Approved by D.C.R. n.15/42 del 28/05/03
Sicilia	To be completed	
Toscana	In force	Approved by D.C.R. n. 1/2000 B.U.R. 1/03/00.
Umbria	In force	Approved by D.C.R. n. 402 del 21/07/04
Valle d'Aosta	In force	Approved by D.C.R. n.3146/XI del 3/04/03.
Veneto	To be completed	
Prov. Aut. Bolzano	In force	Approved: D.C.R. 4/93
Prov. Aut. Trento	In force	n.a.

Note: D.G.R. - Regional Board Decision ; D.C.R. - Regional Council Decision; n.a. - not available

9. Cost of implementing regulation

It varies from region to region.

10 Finances

Besides some national financing sources both of public and private origin, the Structural Funds of the EU are a powerful tool in the policy for regional development and socio-economic cohesion. These funds are aimed at reducing the disparities among different regions. The Structural Funds have different goals for the areas named Objective 1 (Southern Italy), Objectives 2 and 3 (Central and Northern Italy).

The financial resources come in varying amounts from the European Union and from internal funds. Generally, the Funds, in the current programming in effect for 2000-2006, can support both the production of biomass as well as the creation of structures for their energetic valorization. However, not all of the Regions have placed the same emphasis on this possibility. The greatest emphasis was placed on forestation for both production use as well as carbon absorption, while the availability of resources for cultivated land dedicated to energy crops is more varied.

III - Results of the regulation

11. Quantitative results

For each region the present and future availability of biomass for energy use has been evaluated. The thermal and/or electric power to be installed has been also calculated.

12. Replication potential

The methodology adopted for regions may be replicated at province and municipality levels.

13. Communication

Conferences are the main tools for diffusing and circulating results. Local agencies are often charged with these tasks.

IV Monitoring and lesson learned

Monitoring

No monitoring is planned up to now

Analysis and lesson learned

Where approved and came into operation, the PEARs have enhanced the definition and the implementation of biomass projects.

Relevant elements

Effects of existing regulations

The links between energy and environment present in most PEARs have accelerated the implementation of the projects. In some regions, for example, - especially in the north of Italy - lots of district heating plants have been installed and are now in operation.

2.4. Slovenia – Public tender for diversification in agriculture

I - Identification

1. Title

Second public tender for diversification of agricultural and other agricultural related activities – alternative income sources of the Common program document 2004 -2006 (CPD) for the year 2006.

2. Description

The object of this call is assignment no refundable funds for the period from 2004 – 2006 for diversification of agricultural activities and activities which are near agriculture – alternative fundable sources, which contribute to development of supplemental and additional activities on farms and with this improve efficiency of work organizing on farms and assure additional working possibilities and increase of income.

3. Promoter

Ministry of Agriculture, Forestry and Food; Agency of the Republic of Slovenia for Agricultural Markets and Rural Development (AAMRD).

AAMRD - The Agency is fully accredited to implement the most complex procedures as regards the allocation of funds in the field of agriculture, food-processing industry and rural development. Besides implementing direct payments measures, measures of the Rural Development Plan of the RS 2004-2006, agricultural markets measures, rural development structural measures within 3rd Priority task of the Single Programming Document RS 2004-2006 and measures intended for the remedy of consequences of natural disasters, the Agency also implements two measures of the Financial Instrument for the Fisheries Guidance (FIFG - Financial Instrument for Fisheries Guidance).

The AAMRD is responsible for a thorough check of administrative and substantive adequacy of received applications and claims. Within the processing of applications it performs a number of controls that provide a basis for accounting of payments and determining the amounts to be paid in accordance with national and European legislation. The AAMRD ensures proper and timely payment of the approved funds to final beneficiaries and reports upon it to governmental and European institutions.

4. Actors

The actors are farmers, farmers association, individuals and companies, which are working on farm. Individuals and companies which are registered in order with regulation on business, are not authorized to investments for restoration or building and equipment of small modification plants for remodeling of the agricultural products.

5. Regulations priorities

The main priority is to give non refundable funds to farmers for their projects which are good for countryside development. One of the emphases of this call is also to fund restoration or building and equipment of biomass energy plants.

II - Description

6. General description

Background

Slovenian countryside is facing several negative processes such as: depopulation, leaking of interest for agriculturally activities and low paid job. This call is trying to realize some projects which could increase competitive position and bring to farmer bigger additional value. One of the big niches is definitive biomass energy buildings and machines.

Design/management

This call was made by the AAMRD, it was announced 28.4.2006 and ended on 29.5.2006. In this call were object of support following rightful claimants:

- restoration or building and equipment of small remodeling plants for modification of the agricultural products, modification of wood, herbs and forest fruits;
- restoration or building and equipment of areas for tourist activities and recreational areas for the purposes of tourists on farm;
- restoration or building and equipment of workrooms to perform home manufacture;
- restoration or building and equipment of markets of agricultural products;
- restoration or building and equipment of biomass energy plants;
- unions of farmers to restore or build and equipment of objects for purpose joint production and sale.

The AAMRD collected application and analyse them if they suits to all conditions. Applications were valued and defined to grant a request or not.

Objective

The main objective is to hold country people on farm and increase interest in currently non farm people to make business on farm. Also it is important that the emphasis will not be on one or two agricultural products from Slovenia but on many more. Therefore the Slovenian agriculture could be more secured before price reducing of some products.

7. Actions

No refundable funds for farmers in their projects which are good for countryside development.

8. Timing

The AAMRD stopped receiving requests on 29.5.2006.

9. Finances

Approximate funds which were designated to this call were 3.526.212,06 €, out of this:

- from EU-EKUS 1.763.106,03 €,
- and from Slovenian co-participation 1.763.106,03 €.

III - Results of the regulation

11. Quantitative results

Till now we do not know how many applications were approved because there has not passed 60 days since the time limit of the application sending. Till we know it came 63 applications and out of them there were 24 regarding biomass.

12. Replication potential

This type of call is very stimulative for farmers. It could realize large projects and increase development on Slovenian countryside. But most important is this call emphasizes also biomass production and their usage.

13 Communication

The official promoter for public calls for agriculture is AAMRD which is also taking care for communication. All the information are also on their web page.

IV Monitoring and lesson learned

Monitoring

There is a five year time limit when the fund collector could be checked by AAMRD inspectors who are executed the monitoring.

Analysis and lesson learned

For this call were foreseen around 3.526.212,06 € and only 63 applications came. Maybe the time limit was too short, maybe the call was not too good advertised. For this amount of money there should be more requests.

Effects of existing regulations

Due to short period from the end of the time limit of this call we do not know what the effects or results are.

2.5. Germany – Federal Building Code and Land Utilisation Ordinance

I. IDENTIFICATION OF THE REGULATION

1 - Title of the regulation

Federal Building Code (BauGB) and Federal Land Utilisation Ordinance (BauNVO)

2. Brief description of the regulation

The Federal Land Utilisation Ordinance BauNVO and the Federal Building Code BauGB regulate the land use and describe its restrictions. BauNVO and BauGB are the basis for the preparatory land-use plan of the municipalities who decide about the communal development. The urban land-use planning regulates the land use within the borders of the community on the basis of a conceivable public interest, including possible locations e.g. for biomass CHP plants.

3. Promoter

- Federal Ministry of Transport, Building and Housing
- Municipalities

4 - Type of actor involved

- Federal Ministry of Transport, Building and Housing
- Regional building approval authority
- Municipalities
- Public

5 - Regulations priorities

The regulation isn't to be seen as a support instrument for bioheat technologies as it aims at steering a rational land use, avoiding urban sprawl and eliminate building activities against public interest. The BauNVO and BauGB influence therewith the building of energy supply facilities within a community. The settlement of medium and large scale biomass facilities is restricted to demarcated areas irrespective of economic feasibility or requirements of e.g. a biomass CHP.

Geographical approach of the programme : National level, municipalities

II - DESCRIPTION OF THE REGULATION

6 - General description of the regulation

a) Background

The BauNVO is a related ordinance based on the BauGB-Law. These regulations are to steer and arrange urbanistic development by organising urban land-use planning. The derived land-use plans shall contribute to secure a humane environment, to protect and develop the natural resources. The interests of environmental protection, nature conservation and landscape protection – in particular of ecosystems, of waterbodies, air, grounds including their resources and the climate – have to be taken into account.

The BauGB as frame law was implemented on June 23rd 1960 and amended several times. Its latest version is dated July 1st 2005.

b) Design of the regulation (mechanism) and management of its implementation

In several planning levels starting on setting the frame conditions with several mission statements on national level to a more detailed concretisation on regional level to the realisation on community level

c) Objective of the regulation

It is the aim to avoid urban sprawl and burdens for the citizens of a municipality by steering the development process of cities and villages in a social and environmental sound way. The regulations of the land-use planning have great influence on stature, structure and development of the settled area as well as on the “habitability” of the cities and villages. It is the assignment of the spatial planning to coordinate special requirements on different levels (municipality, region, state, etc.) in terms of different aspects (transportation, environment, population, economy, etc.) and to countervail conflicts. Further on provisions have to be made for future functions and utilisation of the area. A sustainable spatial development is aspired which conciliates social, economical and ecological requirements including :

- the unconfined development of personality,
- the protection and development of the natural livelihood,
- the creation of favourable conditions for the economy
- the enabling of a long-term possibility of structuring and planning
- the strengthening of the diversity of the areas
- the creation of equal living conditions in all areas
- the contribution to a coherent Europe.

7- Actions

The Federal Building Code regulates every building project in order to offer best urban development including the necessary infrastructure for public energy supply. It sets the bounds to applicable sites e.g. for biomass heating plants with district heating for example by excluding them because of another foreseen land use, the scale of the installed capacity or the utilised biomass fuel etc. The CO₂-mitigation of bioenergy is doubtless in public interest so that there are approaches to contribute to a sustainable development by favourable regulations for bioenergy use within the Federal Building Codes and its related ordinances. For example the regulations could prescribe a duty to survey the supply of new residential areas with bioheat, e.g. by district heating, and to use it if economically feasible.

Restraints

The settlement of wood energy plants is often seen highly controversial especially when using waste wood. Despite the fact that those wood energy plants using contaminated waste wood have to fulfil the strong conditions of the 17th Federal Immission Control Ordinance (17. BImSchV) requiring effective filter technology (same technology as used by waste incinerating plants). Thus wood energy plants are ranged with incinerating plants and participate in latter bad reputation. Consequently reservations of wood energy plants in the local population are still high, especially if the distance of the planned facility to

inhabited districts is low. This contrasts to the necessity of biomass facilities to be close to residential areas or industrial purchasers of bioheat.

The fact that the Federal Immission Control Ordinance sets especially strong environmental requirements on waste wood energy plants and therewith these facilities aren't to be classified as ecologically damaging it doesn't change people's opinion on them. Thus as those plants are not to be complained about from an environmental view opposers call on the regulations of the Federal Building Code to avoid the approval of a biomass energy plant. Because of unclear formulations many regulations are indigent for interpretation by local authorities which decide whether a planned facility is allowed to be erected at the foreseen location or not.

The related Federal Land Utilisation Ordinance (BauNVO) divides the region into different specific land use areas as for instance industrial area (mainly producing industries), business areas (retail companies, bureaus and producing industry), residential areas, outlying areas etc. The erection of a wood energy plant for the purpose of heat and electricity generation is permitted within the BauNVO in industry areas (§9 BauNVO), for the type of plant specifically demarcated area (§11, article 2 BauNVO) and in a specifically demarcated area for that purpose (§9, article 1, number 12 BauGB). But most communities don't have such demarcated areas and industry areas have a "dirty" reputation that only business areas are expelled. That poses the question if a wood energy plant can also be erected in business areas or outlying areas.

Relating to the BauNVO (§8, article 1) in business areas all projects are feasible which don't significantly affect business undertakings. For approval it is therefore relevant if a wood energy plant affects business within the area in a negative way. If the decision maker decides that it does interfere the businesses in the area no wood energy plant is possible. If he doesn't do so, some exceptions can be made. The question is how to define the fact of an interfering operation? For a judgement it is relevant if the wood energy plant is compatible with other existing and applicable kind-of-uses. Some approaches take the requirements of the Federal Immission Control Ordinance (BImSchV) as guideline for approval in business areas. With this approach those facilities, which have to fulfil the strictest environmental regulations of the 17th BImSchV don't harmonise with business undertakings in the area. And even wood energy plants using not contaminated wood have to be decided on individually.

For an approval in outlying areas the wood energy plant has to be privileged related to § 35, article 1 number 4 of the Federal Building Code (BauGB). With this privilege the plant is feasible if there isn't any suitable area within the community (which is the case if there aren't any industry or special areas demarcated) and if the project is dignified being build in outlying areas (to avoid the building-up with debiting buildings). The plant is dignified when there a common public interest exists as for example the appropriate disposal of waste wood. As seen in the paragraph above it is difficult for wood energy plants finding a suitable area within the community. Thus one can suppose that a privileged approval can be given.

However building the plant in an outlying area means a long distance to potential heat consumers and the incentive to CHP applications declines and the facilities start electricity

generation only. Operators of bioheat plants have to offer their service on the free market and thus to compete with fossil energy carriers which still have lower energy generation costs. One main cost factor of bioheat supply is the district heating grid which is only profitable if a critical mass of consumers with a calculable heat demand is secured. This is hardly the case in outlying areas.

This poses the question if the approval authorities can stipulate the use of the generated heat for example for bioelectricity plants. Even if this approach is judicious for environmental and biomass efficiency reasons and goes conform with climate protection policy of the government it is set bounds to where the possibility of the operator's own heat application is exhausted and a discharge of heat is not economically sensefully realisable because of lacking consumers or necessary infrastructure nearby. This is not least because of the fact that within the federal building policy for above described reasons wood energy plants often are unwanted in the neighbourhood of potential heat consumers.

8 - Timing

The BauGB as frame law was implemented on June 23rd 1960 and amended several times. Its latest version is dated July 1st 2005.

9 - Costs of implementing the regulation (costs on the side of the administration and on the side of the investor)

The Federal Building Code and its related Ordinance do not refer directly to renewable energy technologies but are part of the national strategy for spatial planning and rural development. No extra costs occur on administrative site by implementing the rules for the settlement of biomass plants. Other than the investor as he has to conduct several surveys and has to prove by certificate that his project won't affect environmental requirements and is consistent with public efforts. Even if the emphasise of environmental and public matters is quite important to steer the development in a sustainable and necessary way, many certification and bureaucratic survey requirements exceed the necessary and result into time loss and extra costs for the investor. Actually it is not possible to figure the amount.

10 - Finances

see above

III RESULTS of the regulation

11 -Quantitative results

As this regulation is not to promote renewable energy technologies but to develop spatial planning and public energy supply in a sustainable way, no figures of the effect can be given.

2.6. Sweden – Permit procedure

This is an example of how regulations can slow down conversions to renewable energy sources in the heating sector.

I - Identification

1. Title

Permit procedure

2. Description

Utilization of biofuels may be environmentally desired on a national and global level, but may lead to noise, heavy traffic, dust and emissions that are undesired locally. To build and operate combustion units of 0,5-10 MW, permits from the community is demanded, both regarding building permit according the Planning- and building law (*Plan- och bygglagen*) and regarding environmental issues. For units of more than 10 MW, a permit according to the Environment laws regulation about hazardous operations and health protection (*Miljöbalkens förordning om miljöfarlig verksamhet och hälsoskydd*) is needed.

3. Promoter

National Environment Protection Board.

4. Actors

- Enterprises or persons who build or operate heating plants are targeted by the regulations.
- The National Environment Protection Board gives general recommendations.
- Local communities give permits to build plants of 0,5 – 10 MW.

5. Regulations priorities

These regulations prioritise heating plants and combined heat and power plants. Dwellings are not a priority.

II - Description

6. General description

a) Background

Before building new plants for production or use of biofuels (or other materials), there are several different types of regulations that could delay or even stop the planned plant. Operating of biofuel heating plants results in external effects, both positive (reduced green house gas emissions, employment) and negative (noise, heavy traffic, dust and emissions).

The negative effects are of a local kind and the positive effects are generally more global. For example handling and transportation of biofuels can be a source of noise, which could disturb local inhabitants.

b) Design/management

The permission procedure depends on the size of the plant.

- Units <0,5 MW. No special regulations for particle emissions exist. The National Environment Protection Board has produced “General recommendations (1987:2) for solid fuels combustion units of 500 kW – 10 MW” which has served as the norm
- Units of 0,5 – 10 MW. To build and operate combustion units of 0,5-10 MW, permits from the community is demanded, both regarding building permit according to the Planning- and building law (*Plan- och bygglagen*) and regarding environmental issues.
- Units of more than 10 MW. A permit according to the Environment laws regulation about hazardous operations and health protection (*Miljöbalkens förordning om miljöfarlig verksamhet och hälsoskydd*) is needed for operations.

c) Objective

The objectives of these regulations are purely environmental.

7. Actions

8. Timing

9. Costs of implementing the regulation

It is possible that some investments in biofuel plants will be stopped or at least delayed due to certain demands through environmental regulations. This can be considered a cost for society in terms of loss of renewable, domestic, energy production (at least for the period of delay). This could also be considered a very positive process, since it may result in better flue gas cleaning or lower noise. Whether delayed starts of new biofuel plants are to be considered a cost for society depends on which perspective you use. With a global perspective, a delayed biofuel plant will probably in most cases be considered a cost for society.

10. Finances

not relevant.

III - Results of the regulations

11. Quantitative results

not relevant.

12. Replication potential

Regulations for different operations probably exist in all countries. Regulations of negative external effects from biofuel using plants is one kind of such regulations and should therefore be possible for any country to replicate.

2.7. Germany – Energy Saving Ordinance

Regulations

I. IDENTIFICATION OF THE REGULATION

1 - Title of the regulation

Energy Saving Ordinance (Energieeinsparverordnung (EnEV))

2. Brief description of the regulation

By setting strong thresholds for the admissible the Energy Saving Ordinance EnEV aims at reducing the energy demand of new buildings by 30% to lower the general energy consumption and because of the high energy saving potential of buildings to reduce CO₂-emissions since a third of the national CO₂-emissions is related to energy consumption in the building area. The primary energy demand for heating and warm water supply will be limited with an integrated view on installation- and building engineering to reach the saving objective most flexible and cost effective. The application of renewable energy technologies for heating, air conditioning and warm water supply will be relieved.

3. Promoter

- Federal Ministry for Transport, Building and Urban Development
- Federal Ministry of Economics

4 - Type of actor involved

- National Government
- Regional building approval authority
- Energy agencies and consulting institutions
- Architects and planning bureaus
- Manufacturing industry
- Consumer / building owner

5 - Regulations priorities

The regulation doesn't support renewable energy technologies directly as it aims at reducing energy demand in buildings. The approach is to combine measures on the building construction site (e.g. heat insulation) or on the installation engineering site (e.g. application of renewable energy technologies). The application of renewable energy technologies is just one possible option among others.

Renewable energy technologies in terms of the EnEV are *“used for heating, warm water supply or air conditioning of buildings in spatial relation to solar energy, environmental and geothermal heat and biomass”*.

Geographical approach of the programme : National level, actual obligatory for new buildings

II - DESCRIPTION OF THE REGULATION

6 - General description of the regulation

a) Background

The EnEV is based on the Energy Saving Act EnEG of 22nd July, 1976 which was amended in 1980. The EnEG authorises the government to enact regulations to guarantee energy savings in the building area (heat insulation, installation enhancement, energy demand

certificates). The German Government assumed already in 1994 that it will be possible to adjust the requirements for new buildings from the year 2000 on to lower their energy demand by 25 to 30%. This objective was taken up with the implementation of the first Energy Saving Ordinance in 2002.

With respect to the implementation of the EU-guideline for buildings the EnEG was amended again on 8th September, 2005 to give the legal basis for an amendment of the Energy Saving Ordinance EnEV which will be done in short-term. As the actual EnEV is regulating the calculation methodology for the energy- and heat demand and prescribes the certification of the energy- and heat demand in form of a so called "energy pass" for new buildings, the certification of the existing buildings, the stock, happens voluntary and not uniformly. But as there can especially in the stock be realised huge energy savings the energy pass shall become obligatory for new buildings as well as for the stock with the amendment of the EnEG. For this the EnEV will be amended to concretise the requirements.

b) Design of the regulation (mechanism) and management of its implementation

Under auspices of the Federal Ministry for Transport, Building and Urban Development and the Federal Ministry for Economics a draft of the EnEV is developed under comprehension of scientific experts, technical bodies and results of a field test of the German Energy Agency (dena) to be approved by the government.

c) Objective of the regulation

Reducing the energy demand of new buildings by 30% to lower the general energy consumption to reduce CO₂-emissions since a third of the national CO₂-emissions is related to energy consumption in the building area. The EnEV is part of the national strategy to reduce the national CO₂-emissions in the building area. The objectives are:

- Reduction of the energy demand by 30% to save resources within the building area.
- Contribution to climate protection by reducing energy related CO₂-emissions in the building area.

7- Actions

The EnEV is binding for buildings with an indoor temperature of at least 19° Celsius for at least 4 months per year and those being heated for at least 4 months to an indoor temperature between 12 and 19° Celsius including their installations for heating, air conditioning and warm water supply. The regulation does not apply for premises for the breeding of animals, premises which have to be extensively and long-lasting left open, subsurface buildings, green houses, and buildings which are thought to be removed and set up (e.g. tents, airhouses etc.).

With the amendment the energy consumption of the obliged buildings shall be reduced by 30% compared to applicable law. A main position of points for new buildings is the switch from the consideration of the annual heat energy demand to the annual primary energy demand of the building. The efficiency of the heating system is to be heightened whereas the energy demand of the building should be reduced.

This is justified that the investor's decision on the building construction and applied technology will have a long-term effect on the energy demand. Thus the primary energy

demand is defined as result of the solution the investor has chosen considering the whole added value chain (fuel extraction, conditioning, distribution, installation efficiency...) to minimise energy losses on the way to the consumer.

The investor influences with his decision as well the utilisation of the related fuel affecting the preliminary value chain as well as national economies total energy demand. If he decides himself for a boiler fuelled with natural gas, heating oil or biomass he affects different regional economic cycles. Further on with this decision he won't purchase heat from a district heating system. Thus he is free to choose his primary energy factor but has to fulfil the threshold given for his building.

Actions affecting renewable energy technologies:

Simplification of the application of renewable energy technologies and cogeneration

It is acknowledged that renewable energy technologies contribute to energy saving and thus to CO₂-mitigation. Especially the building area offers many options to use renewable energy technologies as well as cogeneration particularly as there exist proved technologies for warm water supply and renewable heat generation. Thus at the assessment of the primary energy factor the application of renewable energy systems shall be "rewarded" and promoted under consideration of the objectives of the Energy Saving Act and imperative of economic efficiency.

The consideration of the primary energy index in relation to the utilised fuel is the main focus of the EnEV. The limitation of the approved primary energy index can be disregarded if the building is heated at least to 70% by cogeneration, at least to 70% by renewable energy technologies if they are an autonomous heat generator or predominantly by individual systems for single rooms. That means for example that buildings heated with at least 70% wood in an automatically wood heating system don't have to certify a primary energy demand.

Further actions:

Accentuation of the requirements for new buildings :

The average reduction of the energy demand of new buildings shall be 30% but is to be differentiated. The economic range for small buildings justifies a reduction obligation of only 25% whereas large, compact buildings are obliged with about 35%.

Integration of heat insulation and system engineering :

To reach the thresholds the interaction of heat insulation and system engineering gains more importance.

Simplification of the certification procedure for residential buildings :

Because residential buildings are constructed less complicated than non-residential buildings but mark the highest volume on the building market their requirements to calculate their energy demand should be made less difficult.

Definition of requirements for existing buildings :

If installations are being substituted or parts of the building being reconstructed or extended, defined energy demand characteristics shall apply and same as for new buildings energy passes issued.

Increase of the transparency for building owners and consumer by energy passes :
It is the aim of the government to successively induct energy indices in the building area to create transparency for the consumer. This is to emphasise the importance of the energy efficiency at the construction, bargain and leasing of buildings and dwellings on the market.

Regularly adjustments of the regulation to technological standards and European norms :
Regarding technological standards the EnEV shall be revised and adjusted to market development regularly to ensure the regulations embrace the latest norms.

Simplification of applicable law :
To be more flexible existing guidelines and directives as for instance the heating systems ordinance and the heat insulation ordinance are combined.

Implementation of European guidelines into national law :
Several European directives affecting the EnEV, e.g. the "SAVE"-directive 93/76/EEG from 13th September, 1993 for the limitation of CO₂-emissions with an increased energy efficiency are considered.

8 - Timing

The Energy Saving Ordinance EnEV came into force in 2002 and is going to be amended in 2006 to implement European law into national law.

9 - Costs of implementing the regulation (costs on the side of the administration and on the side of the investor)

The EnEV doesn't prescribe how and to what extend the compliance of the regulation is controlled. Within the applicable heat insulation directive, which is part of the EnEV, the control of the related requirements is done within the frame of the building code. The EnEV necessitates no amendment of this practice and thus doesn't cause any additional costs for administration.

Additional costs due to tightened requirements for building owners or consumers have to be economically justifiable. As a governmental expert reports states the additional costs for new buildings as well as for the stock are being amortised by energy saving benefits within the period of the common building- and installation life.

The integrative approach of the regulation allows the obliged to decide whether they fulfil the requirements by constructional heat insulation, enhanced installation efficiency or by combination of both. Future building costs are dependent on the focus of the planned measures. Additional costs can be avoided if both measures are considered at the planning stage, but they are likely if the new flexibility of the instrument is not considered and all is done on the constructional site. If latest is realised the additional building costs will sum up to 1,5 to 2% for small residential buildings (e.g. single occupancy houses), to 1 to 1,5% for large residential buildings (e.g. multifamily residences) and < 1% for non-residential buildings.

10 - Finances

No public money is spent, additional costs for the implementation have to be carried by the obliged.

III RESULTS of the regulation

11 -Quantitative results

As this regulation is not to promote renewable energy technologies but to save energy no figures of the success of the installed renewable energy technologies can be given.

Environmental

As it is said within the EnEV to replace central heating systems elder than 1978 about 500.000 central heating systems mainly fuelled with fossil fuels have to be replaced until 31st December, 2006. Considering the actual market share and development of modern wood pellet systems of 1 to 2% on the heat market a theoretical potential of at least 10.000 units arises.

12 - Replication potential

The EnEV implements European law into national law so the replication potential is given.

13 - Communication

Energy agencies, architects, planning bureaus and specialised internet presences inform and consult about the EnEV, its requirements and special cases.

IV MONITORING & LESSONS LEARNED

Monitoring

Not possible

Analysis and lessons learned

The EnEV offers the opportunity to apply renewable energy technologies, but gives no incentives to do so. Those using RES technologies are already environmentally conscious or being motivated by getting public funding, e.g. by the MAP. This is as well shown by the comparison of the RES heat development and number of promoted applications within the MAP.

An enhancement is considered to combine the EnEV with an obligation to cover a defined percentage (e.g. 5 or 10%) of the energy demand with renewable energies. If this deliberation is sufficient to go for a 70%-coverage as mentioned in the regulation to be released from fulfilling the related primary energy threshold will remain questionable. The coverage of a lower percentage of the energy demand by RES will favor mainly solar energy systems as this technology is well suited being added to a main heating system. But especially biomass and geothermal facilities are economically feasible only if operated in full supply. Thus it is likely that such an obligation won't affect the bioheat market very much.

Irrespective of this general aspect many questions concerning technical transfer of biomass and RES applications into the requirements of the regulation are still not answered as the diversity of RES technology applications is not yet covered in the related norm on which the EnEV refers to. Here a strong backlog demand exists.

2.8. Slovenia - Decree on marginal emission values from large boilers

I - Identification

1. Title

Decree on marginal emission values from large boilers.

2. Description

With this decree, which became operational on 5 August 2005, special demands regarding emission of SO₂, CO and dust for large boilers are determined. The determinations of this decree are used for all large boilers (at least 50 MW, heat and/or power), regardless if the fuel is solid, liquid or gas.

3. Promoter

Slovenian Ministry of the environment and spatial planning.

4. Actors

Managers of large boiler.

5. Regulations priorities

These regulations main priorities are:

- Reduction of emission of SO₂, CO and dust,
- Determine fuels and adaptation old large boilers to new demands.

II - Description

6. General description

Background

Because of price climbing of fossil fuels for heating the interest for large boilers increased. But their emission limits were not adjusted with standards of EU.

Current decree is based on old decrees, which regulated emission within range of RS and is adjusted with standards of EU.

Design/management

In Decree on marginal emission values from large boilers are determined limit values of emission for:

Classification of burning devices

TABLE 1		Burning devices		
BOILERS	Type of fuel	small	medium	big
ON SOLID FUELS	Usual fuels	< 1 MW	≥ 1 MW and < 50 MW	≥ 50 MW
ON LIQUID FUELS	Oil fuel EL	< 5 MW	≥ 5 MW and < 50 MW	≥ 50 MW
	Heavy oil fuel	prohibition	≥ 1 MW and < 50 MW	≥ 50 MW
	Methanol, ethanol, ...	< 100 kW	≥ 100 kW and < 1 MW	≥ 1 MW
ON GAS FUELS	Gas fuels	< 10 MW	≥ 10 MW nad < 50 MW	≥ 50 MW

Emission threshold values for large boilers

Substance	Explanation	Solid fuels	Liquid fuels	Gas fuels
Collective dust	Area	≥ 50 MW and < 100 MW: 50 mg/m ³	≥ 50 MW and < 100 MW: 50 mg/m ³	For gas from steel industry: 30 mg/m ³ , for blast furnace gas: 10 mg/m ³ , for other gases: 5 mg/m ³
	Area	≥ 100 MW: 30 mg/m ³	> 100 MW: 30 mg/m ³	
CO		250 mg/m ³	175 mg/m ³	100 mg/m ³
NO ₂	Area	≥ 50 MW and ≤ 100 MW: 400 mg/m ³	≥ 50 MW and ≤ 100 MW: 400 mg/m ³	≥ 50 MW and ≤ 300 MW: for earth gas 150 mg/m ³ , for other gases: 200 mg/m ³
	Area	≥ 100 MW and 300 MW: 200 mg/m ³ For biomass: 300 mg/m ³	≥ 100 MW and ≤ 300 MW: 200 mg/m ³	
	≥ 300 MW	200 mg/m ³	200 mg/m ³	
SO ₂	Area	≥ 50 MW and ≤ 100 MW: 850 mg/m ³ For biomass: 200 mg/m ³	≥ 50 MW and ≤ 100 MW: 850 mg/m ³	For liquid gas 5 mg/m ³ , for coke gas: 400 mg/m ³ , for blast furnace gas: 10 mg/m ³ , for other gases: 35 mg/m ³
	Area	> 100 MW and ≤ 300 MW: 200 mg/m ³	> 100 MW and ≤ 300 MW: linear from 400 mg/m ³ for 100 MW to 200 mg/m ³ for 300 MW	
	Area	> 300 MW: 200 mg/m ³	> 300 MW: 200 mg/m ³	
Content of O ₂		6 vol. %	3 vol. %	3 vol. %

Limit emission values for medium boilers

Substance	Explanation	Solid fuels	Liquid fuels	Gas fuels
Collective dust		< 5 MW: 150 , ≥ 5 MW 50 mg/m ³	50 mg/m ³	for blast furnace gas: 10 mg/m ³ , for other gases: 5 mg/m ³
CO		250 mg/m ³	170 mg/m ³	100 mg/m ³
NO ₂		650 mg/m ³	Oil fuel EL: 250 mg/m ³ , for heavy oil fuel: 350 mg/m ³	200 mg/m ³
SO ₂		2000 mg/m ³	1700 mg/m ³	for liquid gas: 5 mg/m ³ , for other gases: 35 mg/m ³
Anorganic halogenous gas substances	Cl as HCl	30 mg/m ³	-	-
	F as HF	5 mg/m ³	-	-
Organic substances (TCC)		50 mg/m ³	-	-
Content of O ₂		Biomass: 7%	3 %	3 %

Limit emission values for small boilers

Substance	Explanation	Solid fuels	Liquid fuels	Gas fuels
Collective dust		150 mg/m ³	150 mg/m ³	150 mg/m ³
CO	For solid fuels: >50 kW and ≤ 150 kW > 150 kW and ≤ 500 Kw > 500 kW	4000 mg/m ³ 2000 mg/m ³ 1000 mg/m ³	175 mg/m ³	100 mg/m ³
NO ₂			250 mg/m ³	for liquid gas: 150 mg/m ³ , for earth gas: 200 mg/m ³
Content of O ₂		For biomass: 13 %	3 %	3 %

Objective

These regulations main objectives are: reduction of emission of SO₂, CO and dust, increase usage of fuels which are less noxious for the environment and adaptation of old large boilers to new demands. This leads to increased of new large boilers usage.

7. Actions

Decree on marginal emission values from large boilers defines :

- Limit emission values
- Types of fuels, of which emission due to combustion in large boilers manage this decree
- Arrangements in condition with emission in the air
- Adjustment of old large boilers

8. Timing

This decree came into force on 5.8.2005.

9. Cost of implementing regulation

Due to decree will probably old large boilers be modernized or they will be exchanged with new ones.

10 Finances

This decree is financed from state budget.

III - Results of the regulation

11. Quantitative results

According to the project of the Ministry for Environment, Spatial Planning and Energy "Programme for the Wood Biomass Use for Energetic Purposes in Slovenia, 2001-2004" as a primary energetic document for the promotion of the use of wood biomass in energetics, constructions and installation of:

- 50 larger systems (average power 3MWt), which besides district heating systems include also larger industrial boilers,
- 100 modern boilers for the medium power range (average 300 kW), which also involve micro district heating systems;
- and 5000 smaller boilers (power 30 kW or less) is planned.

In timeframe are till 2010 define next goals:

- Share of renewables for heating increase from 22 % in 2002 to 25 % till 2010
- Increase share of heat from district heating systems, develop new and preserve old

12. Replication potential

In compliance with this decree will increase efficacy and reduce loss. Changes will reduce price effective large boilers because of demand increasing.

13 Communication

Official gazette RS is the official bulletin for communicating Parliament Acts in RS.

IV Monitoring and lesson learned

Monitoring

Monitoring is executed by mandatory personnel of the Ministry of the environment and spatial planning. Control on this decree is executed by inspectors competent for environment.

Analysis and lesson learned

The key elements of success of this decree is reduction and simplification of groups of large boilers (just large, medium and small), unambiguous limits (look tables above) and effective monitoring.

Effects of existing regulations

Due to short period from the start of implementation of this decree (5.8.2005) no analysis has been made till now and therefore no results can be given on this issue.

2.9. Sweden - Landfill legislation

I - Identification

1. Title

Prohibition of depositing combustible waste.

2. Description

Since 2002 it is prohibited to deposit assorted combustible waste in Sweden. Since 1 January 2005 it is also prohibited to deposit other organic waste. These prohibitions give incentives to increase the utilization of waste for reuse, recycling and energy production in order to minimize the amount of deposited organic waste.

3. Promoter

Swedish Ministry of Sustainable Development (Previously called *Ministry of the Environment*).

4. Actors

Companies that are collecting and handling waste are the targeted group.
The County Administrative Boards can allow exemptions from the regulations.

5. Regulations priorities

These regulations main priority is to minimize the amount of waste deposited on landfills since that means wastefulness with both material and energy. Priority therefore lies in both material recycling and energy production in large scale facilities.

II - Description

6. General description

a) Background

Waste can be used in several different ways. The waste hierarchy sorts these ways in descending order after how they provide the best solution for waste to be used.

- Re-use of things before becoming waste.
- Recycling of material from the waste (e.g. scrap metal, glass, paper)
- Energy production
- Deposition

By minimizing part number 4 (deposition) through regulations, more combustible material will have to be treated in part numbers 1-3, which includes energy production.

According to a report from RVF (rapport 2003:12) fossil carbon emissions in flue gases from waste combustion show that about 85 % (weight) of the waste is to be considered as renewable fuel. The report shows that from the weight of the waste before combustion, 72 % is renewable combustible waste, 14 % is fossil combustible waste and 14 % is non-combustible waste. The emission factor for CO₂ is 25 g/MJ fuel.

b) Design/management

According to 9-10 §§ of the regulation (2001:512) about deposition of waste, it is not allowed to deposit neither assorted combustible waste nor organic waste.

The county administrative boards however have the possibility to allow exemption from the regulation in certain cases. According to the National Environment Protection Boards regulations (NFS 2004:4) about handling of combustible waste and organic waste, the County Administrative Board may allow exemption only due to particular reasons.

c) Objective

These regulations main objective is to minimize the amount of waste deposited on landfills since that means wastefulness with both material and energy. This leads to increased both material recycling and energy production from waste.

7. Actions

8. Timing

These regulations came into force on 16 July 2001.

9. Costs of implementing the regulation

Many communities have started to build heating plants for waste material as a means of solving two problems, both getting rid of waste and producing energy for district heating and often also power production. This is a cost in the short term, but may be a good investment in the long term.

10. Finances

see above.

III - Results of the regulation

11. Quantitative results

12. Replication potential

Utilization of waste for heat and power production is preferably done in large scale combustion units with flue gas cleaning and connected to district heating networks. This way the energy can be utilized with minimal emissions. The existence of district heating networks will probably be a success factor when replicating these regulations.

13. Communication

IV - Monitoring and lessons learned

Effects of existing regulations

The green certificate system for electricity has an impact on the waste combustion units that are being built. Since power production from waste does not lead to allotment of green certificates, the incentives to produce electricity from waste combustion are lesser than for other biofuels, which do lead to allotment of green certificates.
