

# Development of the Dutch Energy Efficiency Action Plan

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## Keywords

energy efficiency, white certificates, policy implementation, policy instruments, energy efficiency policy, ESCOs

## Abstract

Energy efficiency is once more at the top of the policy agenda in the Netherlands. In fact the Dutch government wants to be one of the frontrunners of the EU in this field. Reasons for this renewed attention for energy efficiency are:

- security of supply
- renewables are still too expensive to have an important impact on energy supply
- concerns about climate change

June 2007 at the latest, the Netherlands will have to submit the first National Action Plan for Energy Efficiency under the ESD to the Commission. This will partly be inspired by our 4-yearly energy policy document The Energy Report (2005), but mainly by our new governmental policy.

The Dutch Action Plan will contain a promotional programme to increase energy efficiency. It will consist of a combination of current and new policy instruments. A number of them like for instance white certificates, smart metering, and revolving funds will be discussed. Although not all of them shall be included in the Dutch Action Plan yet they will become elements of the policy that is being drawn at the moment and that will lead to 2 % energy efficiency improvement/annum.

It will address all sectors of the economy, including the transport and greenhouse sectors.

In order to achieve the goals set, new instruments will be added. Existing instruments with a low impact in the past, but

with proven results abroad, will be redesigned and reintroduced. ESCOs, in combination with financial instruments, will be one of these instruments.

This Dutch Action Plan for Energy Efficiency will double as Energy Efficiency Action Plan (EEAP) within the framework of The Energy End-Use Efficiency and Energy Services Directive (ESD).

In this paper, we will elaborate upon this upcoming Dutch Action Plan, the development process, the instruments employed and the expected problems of implementation.

## Introduction

The Energy End-Use Efficiency and Energy Services Directive COM (2003)739 (ESD), which was adopted in March 2006, seems to fit very well in both the international and national policy of the Netherlands. Based on the four-yearly energy policy document The Energy Report, the Dutch government had already planned to publish an Energy Efficiency Action Plan. This was scheduled to be published by the end of 2006.

However, in November 2006 a new Dutch House of Representatives was elected. Although the Dutch Energy Action plan is delayed by the elections, the direction on energy policy seems to be unchanged. The new-elected House of Representatives is expected to be even more determined to realise the energy efficiency goals, and also to set more ambitious goals for energy efficiency (see section on New political developments).

In this paper, we will first briefly describe the recent past of Energy and environmental policy in the Netherlands, as well as the results. After that the present policy is presented. In the third section, we will deal with new policy developments that

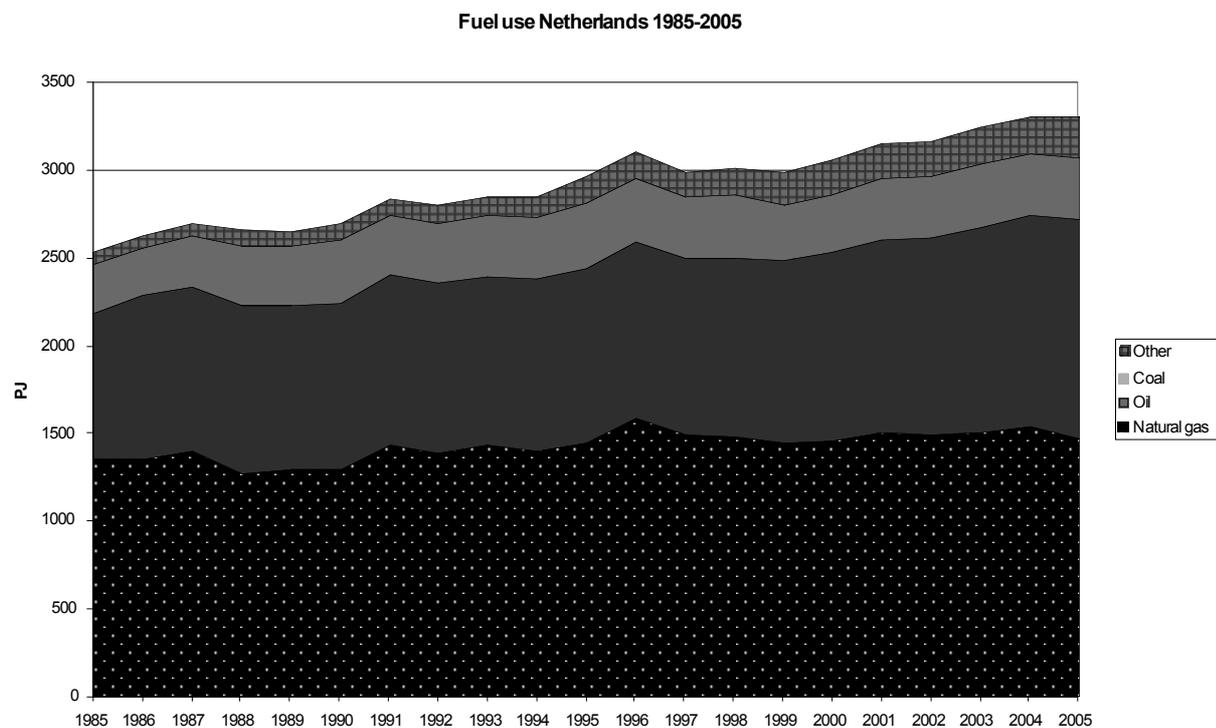


Figure 1 Fuel use in the Netherlands (ECN)

most probably have an effect on the Energy Efficiency Action Plan.

Then the options and choices to realize the policy goals are elaborated upon. Afterwards, we will briefly elaborate upon the pros and cons of the European obligation. The section on Details of the Dutch approach deals with some of the obligations of the ESD, and what will be the response to this. After this, we will come to the Monitoring section. In the last section, we formulate conclusions and recommendations.

## Energy and environmental policy of the Netherlands through the years

### ENVIRONMENTAL POLICY

The Netherlands have an environmental policy since 1972, when the government issued the “Urgentienota Milieuygiene” (Urgency Policy Document on the Environment). It started as a policy on separate environmental compartments and with the emphasis on legislation. In the decennia that followed the policy broadened, both in topics as in instruments. This policy is updated every five years.

In recent years environmental problems were dealt with on the basis of two policy documents, the national environmental policy (NMP) and the National Energy Policy Plan (NEPP) (Egmond, 2006).

The NMP is an “umbrella” document with a broad scope. The NEPP specifies the actions to be taken on specific energy efficiency topics.

The policies were evaluated, and have had positive results. Nevertheless, the total energy use kept growing, only the use of coal stabilized (See Figure 1)

The most recent NMP’s and NEPP’s were, more than before, target group oriented, with more emphasis on other instruments than regulatory instruments, like financial, behavioural and voluntary instruments.

The 2006 Environmental policy plan “Future Agenda Environment: Clean, Smart, Strong” specifically states the importance of the European cooperation. Environmental problems are international problems, and therefore cannot be dealt with solely at the national level (van Geel, 2006). The last NEPP was presented to parliament in 2005.

### ENERGY POLICY

The over-all responsibility of energy policy lies with the Minister of Economic Affairs. Important parts of the (implementation of) energy policy are internalised to other departments like the department of Social Housing and the Environment (VROM) and the Ministry of Agriculture. So the energy policy is integrated in other policies, like housing and the policy for the greenhouse sector.

The overall goal of the energy policy has changed over the years. Thirty years ago, energy policy was about security of supply. Then the limitation of natural resources became the major topic. Nowadays global warming and, again, security of supply are the major drivers.

Environmental and energy policy come together with the Kyoto protocol. The Kyoto-obligation of the Netherlands is a 6 % reduction by 2012, a target that seemed quite realistic when the Netherlands signed the treaty. This target is approximately 200 Mton CO<sub>2</sub> equivalent/annum during the period 2008-2012. Half of this reduction will be realized by Joint Implementation (36 Mton) and Clean Development Mechanism (64 Mton). The other half has to be realized by measures within the Netherlands.

**An overview of (considered) policies and their effect (Brinkhorst, 2006)**

Energy Saving/annum	(Considered) policy measures	
Extra national policy 0,3 %	White certificates Regulation CO2 reduction build environment Extra 80 km/h zones BPM differentiation Eco-driven III	Development and implementation of financial market instruments New LTA with industry CHP focus on new CHP Heat company in Rotterdam Programme Electroengines
Existing policy 0,3	Energy tax EPC new buildings Energy performance advice Labelling appliances Regulation on greenhouses	Energy Investment Tax deduction CO2 reductionplan Benchmark covenant on industry Information centre on small and medium business LTA Eco-driven I & II
0,7 %	Autonomous energy efficiency improvement	

The progress on this objective is measured annually by ECN; the climate policy is evaluated every five years.

The 2005 climate policy evaluation showed the results of the national efforts: the emission reduction was 5 % higher than what might have been expected without these efforts. At the same time the evaluation states that a divergence of 50 % in 2012 is possible and that extra measures to secure the Kyoto targets were advisable.

The monitor results of ECN add a more gloomy tone the last 3 years. The national energy saving rate is slightly dropping. The predicted 1,3 % energy saving/annum, which is also the policy target, dropped to below 1 %. This is specially remarkable as these measures are cost effective.

So after ten years with an average annual energy efficiency of 1 to 1,3 %, the trend is that savings are going down instead of up (Gijssen et al. 2006).

The most important reasons for this trend are the usual suspects (Ybema et al.):

- the growing energy use of transport sector;
- the energy sector was less carbon efficient as more coal was used;
- more industrial emissions due to the growing economy;
- renewable energy is still far too expensive to become a major player;
- the introduction of bio fuels is almost nonexistent.

**New policy developments**

In 2005 the parliament asked the Dutch government to set an annual energy efficiency goal of 2 %. The Minister of Economic Affairs stressed on 24 May of 2005 that this goal could be reached in the coming years. Since February 2007, The Netherlands have a new government, and they have set an annual energy efficiency goal of 2 %

An energy saving target of 1.5 % is economically profitable in the Netherlands. A good implementation of European policy delivers another 0.2 %. The specific actions which have to be taken within an European framework are labelling of appliances, cars and delivery vans (Brinkhorst, 2006). See Table above.

An increase to 1.7 % per annum will cost about EURO 125 million. These costs will rise to 4.5 billion euros at 2.3 % annual energy savings. As an ECN paper indicates, a set of measures to save 2 % of energy use can realistically be defined (Daniëls et al 2006). The most important conclusion of this paper is that a strict introduction of European objectives in transport, built environment and appliances will provide the greatest contribution. An absolute stipulation to realise this, is to implement these measures as soon as possible. Next to speed, enforcement will be a prerequisite. Also, a great effort will be required from industry.

National costs<sup>1</sup> for a set of measures to reach 2 % annual energy savings will app. be 3.5 billion EURO on an annual basis, of which the main part is due to measures for the existing housing and utilities. Costs for government will amount to 1.4 billion EURO, while the gains for households and companies will measure € 1.5 billion. These amounts consist of very big positive and negative components. These costs do not include the gains in improved security of supply, reduction of CO<sub>2</sub>-emissions, reduction of transport congestions and lower emissions of acidifying components and PM10.

As such this does not conflict with the conclusion of the Stern report, which assumes that taking action now is the best option economically (Stern 2006).

In February 2007 the new Dutch government announced in their Governmental Statement new incentives on environmental policy. The EEAP is scheduled too soon to be used in this respect. The Netherlands will fully apply and, at the same time start working on implementing the 2 % reduction/annum.

The main elements to reach the 2 % goal in 2020 are summarised in the Table overleaf. As technical developments and even breakthroughs are necessary to achieve a more efficient society, the Netherlands depends on the EC.

After determining the potential, the realisation of this potential will be the next step. First and foremost, the market has to be stimulated to take its responsibility in this matter. Many things occur in this field, both with individual companies as through initiatives like “triple bottom line” and “bottom of the

1. National costs: yearly costs for the Netherlands of all the measures taken to reach 2 % energy saving, without costs for policy. Indication of societal costs and benefits, based on discount of 4 %, and valuation of energy use based on world market prices. These costs do not include benefits in improved security of supply, reduction of CO<sub>2</sub>-emissions, reduction of transport congestions and lower emissions of acidifying components and PM10.

**Annual energy saving in 2020 (After ECN 2006, option document and Harmeling (2005))**

	Energy saving [PJ]	National costs Mln €	Main measures
Industry & Energy	168	340	New price incentives Energy efficiency improvement of Electro-engines in industry
Agriculture	41	78	New price incentives Less heat use in greenhouses
Tertiary sector including public buildings	106	754	Regulation: EPC from 0,8 (2005) to 0,4 (2015) Obligatory efficiency measures by mutation in tenant or ownership of building to at least class D
Build Environment	143	1858	Strict regulation on appliances (within EU framework) (f.i. abandoning incandescent light, fridges > 40 % efficient compared to 2005) Smart metering
Transport	146	445	Car emission < 120 gr CO2/km (New cars only A or B label) European Aviation tax Technical speed limitation of delivery vans (100 km/h) Overall limitations on highways
Total	604	3475	

pyramid". These market driven actions however are outside the scope of this article. In the Netherlands the implementation programmes of SenterNovem are particularly significant for the cooperation between government and society. The optimal way to influence the market is researched in numerous areas and the results of these studies lead to changes in implementation programmes.

Summarizing we can state that the Netherlands have a long history of planning and successfully implementing environmental and energy policies. During the more recent years, cost effectiveness, and reduction of the administrative burden for the market, has played an important role in policy formulation and realization. Although the Netherlands have lost their leading position in Energy Efficiency because of that, the policy is still rather successful.

Environmental issues were an important issue during the election campaign of autumn 2006. Since the elections, there is a wide majority in the Dutch parliament that supports a more stringent policy. This will be fleshed out during the next few years.

Apart from the technical measures to be taken, the government must start a publicity campaign to broaden the public support. This is advised in a recent report of the National Energy Council, the national advisory body on energy issues (Algemene Energieraad, 2006). Lack of support is seen as the biggest probable cause of failure for the ambition to reach 2 % energy savings/year

When we take the Commissions' Integrated Energy and Climate Change Package to cut emissions in consideration, the necessity for national support becomes even bigger. With the 2020 goals - 20 % energy efficiency and 20 % sustainable energy - a simple advertising campaign will not be sufficient. Only a continuing and systematic message to all levels of society, in combination with very specific feedback will influence public opinion to act in a more energy efficient and environmental conscious way.

### Formulating new energy policies, matching the European Framework

The previous part shows that the Netherlands have a good framework for developing and implementing energy policy. There is always a set of extra policy measures in the drawer that can be further developed and implemented if the current set of measures does not deliver the objectives. Combined with a good monitoring system, this results in a policy that is easily adaptable if more stringent objectives are set, or if the goals set will not be reached with the present policy measures. Table 1 summarizes the main points of Dutch energy use.

The goal of the Energy Service Directive, the cost effective improvement of energy efficiency with the end users of energy, fits very well with the present focus of the Dutch energy policy on cost effectiveness.

**Table 1 Overall energy balance of the Netherlands, 2005 – summary**

Overall energy balance of the Netherlands (General-trade system), 2005- summary

	Coal & Coal products	Oil & oilproducts	Electricity	Other Energy	Total	
<b>PJ</b>						
Extraction	-	98	2357	9	165	2628
Import	554	7259	688	85	-	8586
Export	206	5187	1565	19	-	6978
National use	342	1249	1480	75	165	<b>3311</b>
Consumption balance	342	1249	1480	75	165	<b>3311</b>
Consumption balance	10	38	45	2	5	100
<b>%</b>						
<b>PJ</b>						
Consumption Energy companies	247	187	496	-265	-3	<b>662</b>
Final use energy consumers	89	1055	849	372	247	<b>2612</b>
- Industry	85	507	276	145	174	1187
- Transport	-	481	0	6	-	486
- Households and others	4	68	574	222	72	939
						100%
						45%
						19%
						36%

The implementation of Dutch policy, however, differs partly from the descriptions in ESD, so partial adjustments to the policy must be made.

During the adjustment of Dutch policy, special attention must be paid to the core elements of the ESD. A detailed check must be administered to:

- bringing up indicative target figures
- removing (market) barriers
- stimulation of the market for energy services

The European Energy Efficiency Action Plan has stimulating as well as limiting effects on further Dutch policy development.

The stimulus chiefly radiates from the goals that it sets. When formulating policy in Europe, it seems to cost as much time lately to negotiate goals and underlying figures as to actually give substance to the policy. Still, the consensus in the Netherlands is that the European message makes an accentuation of Dutch policy necessary. The Netherlands actively propagates this notion, in consistency with the National Environmental Agenda.

The Dutch Prime Minister has asked the president of the European Council to lead the way. In a joined statement with the Prime Minister of Great Britain they asked to treat economy, climate change and security of supply as interdependent topics that need the highest attention. The period beyond 2012 is the era that should be addressed in the next five years in a ground breaking approach, based on e.g. the scientific knowledge of climate change, technology and economy. (Balkenende & Blair 2006). Furthermore, the Stern report is seen as solid basis to discuss a clean and secure economical development. (Stern 2006)

With this encouraging support for the mid- and long term development we are stuck with the problems of shaping the short term actions in a form that fits the long term goals in an appropriate manner.

The restraining element is the moment and the form of the European Action Plan. The schedule for member states to submit their plan of action in Brussels does not fit with the Dutch policy cycle. Of course the Netherlands are not unique in this. The Commission has set up a new policy cycle, with the National Energy Efficiency Action Plans. It is logical that this policy cycle does not, from the start on, fit with the policy cycles in all Member States. Undoubtedly this will be harmonized all over Europe for the EEAP's of 2011 and 2014.

To settle this for the first National Energy Efficiency Action Plan, the Netherlands have chosen a pragmatic solution. Existing policies will be mathematically adapted to meet the goals of European policy. New elements of the European strategy will be added to strengthen the Dutch policy thereby securing the nation will live up to its obligations.

### Details of the Dutch approach

In this part of our paper we look at details of the Energy Service Directive that need special attention in the Netherlands.

### THE GOVERNMENT AS A MODEL FOR THE PUBLIC SECTOR (ARTICLE 5 ESD)

In the Netherlands the government's role as a model is considered very important. At the moment the programme Sustainable Operational Management Authorities (DBO) is brought into action with this in mind (duration 2005 – 2010). The aim of this program is to make sustainability an important argument in all governmental investment. Early 2007 the programme results of the first two years will be made public. The programme fits very well in the Dutch culture of pursuing consensus and, rather than imposing legislation, trying to reach agreements between a sectors and governments. In its range of ideas it is comparable to the voluntary agreements with industry, which have been highly successful in the Netherlands.

Strong points of DBO are cooperation with authorities, the development of guidelines on energy efficiency and sustainability public procurement and the exchange of best-practises. The propagation of being a role model is dealt with excellently.

DBO develops and updates guidelines for sustainable public procurement for different types of products (appliances, catering, printing, ICT-hardware, buses for public transport, etc). These guidelines can freely be used by governments. Furthermore, DBO provides information about how governments can take up sustainable public procurement in their policies, provides best practices and serves as a forum for governments.

DBO is a voluntary agreement, however, and as such it is at odds with the ESD, where the issuing of rules is required. Further analysis of and discussion about the legislative requirements of the ESD and the proven, non-legislative, methods in the Netherlands is necessary.

### REGULATION FOR THE ENERGY SECTOR (ARTICLE 6 ESD)

The Dutch government will set an energy saving objective for energy suppliers, to be reached by taking energy efficiency measures at their customers' premises. This is the concept of white certificates, however, without the possibility to trade in white certificates. From the results from IEA-DSM task 14 on White Certificates we know that there is a potential here, but for the time being The Netherlands has chosen to make a limited start. The method now chosen can be compared to the one in Great Britain which has clearly demonstrated effects. To realise the objectives, the energy sector has several options.

For CHP there is still a lot of potential. For a long time the Netherlands have been a country where this option has been very successful (53 %, the highest percentage in Europe). A further growth in the industry sector is still possible. Micro CHP is possible in households. Experiments with micro-CHP are underway.

### ESCO'S

The use of energy services is another option to fulfil the energy suppliers' obligation. ESCO's have never been very successful in the Netherlands. The reasons for this are not completely clear-cut, although one reason is probably the very active government role in promoting energy efficiency. Anticipating the ESD, the Netherlands have joined IEA DSM Task 16 – Competitive Energy Services. SenterNovem and Essent participate in these tasks, so the utilities have direct access to the best practice in Europe.

Governments have to create a level-playing field for energy services, according to the ESD. The Dutch government has commissioned research into the importance of ESCO's for the Dutch industry. The importance of ESCO's to realize the energy savings objective has been demonstrated in this study (De Haan & Benner 2005)

Within the public sector the role of ESCO's is limited. The Rijkgebouwendienst, an state agency, has possibilities to act as an ESCO for governmental buildings. They have the possibility to use public private partnerships (PPP) as a tool. They use the DBFMO model (Design, Build, Finance, Maintain & Operate). This model uses lifecycle costs. As such, more energy efficient measures can be implemented.

But: the success of energy services depends on the market reaction. ESCO's are looking for possibilities to improve their offer to clients. As an example: new in the Dutch context is the cooperation between the utilities and the banks. By offering finance as part of the service the implementation of energy efficient measures is much easier for clients than in the past. While the government will stimulate a ESCO market as much as possible, they will not finance such a market. As part of a subsidy scheme this has been done twice in the past, but it did not result in a (financially) independent market in this line of work.

#### BETTER INFORMATION FOR CLIENTS AND SMART METERING

Supplying information is well organised in the Netherlands. A foundation, MilieuCentraal, focuses specifically on consumers regarding environment and energy. Concerning energy they advise in the fields of sustainable energy, energy savings and choosing an energy supplier. Financed by the Dutch government, on the one hand they provide information, on the other hand they contribute to the development of a competitive market on energy efficient appliances. This last goal is achieved by counselling about labels and average energy rates. Without committing to specific brands and types they provide the people with the means to reach sustainable decisions. Specific market information in the Netherlands is, like in most European countries, the task of consumer's organisations.

As an example of market information we have enclosed a diagram. Based on the size of the household, it is directly determined what the energy use is, compared to a nationwide average. Besides the internet information MilieuCentraal offers practical support like rental of energy meters to determine the efficiency of appliances.

The rest of the energy users market is provided with information by SenterNovem. This information is adapted for each target group. Examples can be found on the website of SenterNovem ([www.senternovem.nl](http://www.senternovem.nl)).

In addition the government stimulates the market to take its responsibility concerning product information. The government is supported in this by the before mentioned organisations. Next to that the government assumes that through further implementation and range of the Ecodesign Requirements For Energy-Using Products Directive there will be a positive reaction.

The Ministry of Economic Affairs is currently negotiating with the utilities to install smart meters (gas and electricity) at all end-users in the period 2007-2012.

Connected to this is the regulation of the energy market: separation between energy suppliers and energy distributors and the position of energy measurement companies.

In this model the net regulator, a state entity, is the owner of the smart meters. It has been decided to install smart meters on large scale in three periods of 2 years with an evaluation after each period to secure the process keep on track.

In a letter to the House of Representatives, the Minister of Economical affairs states the smart meters are primarily means to stimulate a competitive market (Brinkhorst 2005). Billing will be much cheaper and it will become much easier to change supplier. The influence on energy efficiency is estimated to be futile. Price elasticity is, in the vision of the government, much too small to make a difference based on information only. All parties do agree that a smart meter does not save energy as such. Extra research, demonstration projects and testing will be necessary to utilize the possibilities of the technological possibilities.

#### Monitoring

The Netherlands have their own method to evaluate its policy and policy implementation. [From Policy Preparation to Policy Audit (VBTB) (Zalm 1999)]. Under the supervision of the National Court of Audit quantitative and qualitative data are collected to evaluate the success rate of policies and programmes. As part of this method huge amounts of data on energy policy and programmes are collected by ECN. With these data, the major part of a top down monitor that is required by the ESD is already in place. SenterNovem develops monitoring protocols for a number of market sectors. They also play a major role in

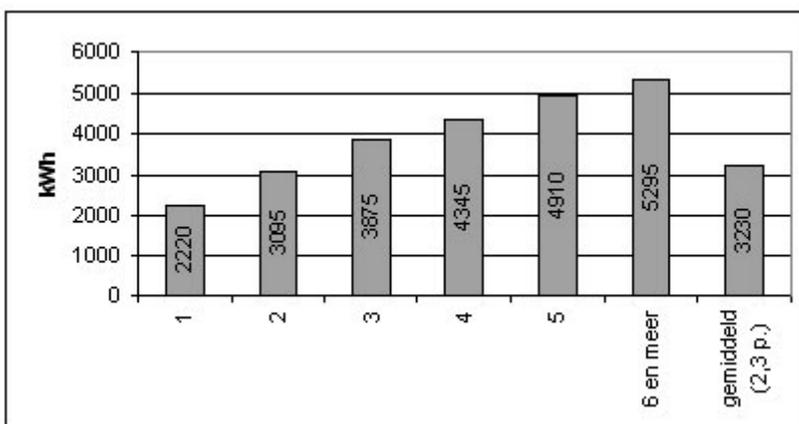


Figure 2 The use of electricity in 2000 according to family size (EnergieNed 2002)

the voluntary agreement programmes with industry and they cooperate with the Verification Bureau Benchmark. This bureau is working on the improvement of energy efficiency in industries within the emission trading system. The combined information is a solid basis for bottom-up research. (Not all this information will part of the ESD monitor as ETS is excluded).

Both ECN and SenterNovem take part in EMEES, the European monitoring programme under IEE. With SenterNovem as NDA we cooperate closely with ECEEE and other European partners to further develop the monitoring schemes.

## Conclusions and recommendations

### CONCLUSIONS

In this paper, we have briefly described the recent history of Dutch energy and environmental policy, and the new developments in energy policy. Based on this, we can conclude that the Netherlands have a good basis to draft a National Energy Efficiency Action Plan, although the deadline for this Efficiency Action Plan within the framework of the ESD is short.

We have also described a few elements of the Dutch Energy Efficiency Action Plan. The goals and the dates for implementation of parts of the ESD seem quite achievable for the Netherlands. This can be concluded from the results of long term energy and environmental politics of the Netherlands and a number of in depth studies on the present options. This however does not mean that it will be an easy task. We need to go against the grain to increase the level of energy efficiency to the pace that is inevitably needed. Both in policy and society we can detect a willingness to act on climate change. For this policy to be successful, long-term commitment to influence society is essential.

It is most important that policy making and implementation are stimulated both top-down and bottom up. World-leaders cannot be blamed of ignoring Climate Change of energy the last couple of years. The G8 of Gleneagles and Moscow and the consecutive presidencies of Austria, Finland and Germany have put "energy" on the top of the political agenda.

Bill Clinton is supporting this with his 40 cities initiative and he is supported strongly by his former vice president Al Gore. The latter certainly had a tremendous influence on public awareness with his "Inconvenient Truth" (Al Gore, 2006).

So, the topic is on the agenda now. On European and national levels major steps still will have to be made to secure and strengthen long-term support within society. Research and more policy, and more important, effective implementation of these policies are inevitable.

### RECOMMENDATIONS

It is not acceptable within the European Political arena for the Commission to prescribe how national policies have to be developed. This leads to the curious solution to determine a monitoring method after legislation has been completed and also after national policy plans have emerged. So in fact the elements on which member states have to report and the way in which they have to do that is determined afterwards.

Although this makes sense in a political context, it leads to sub-optimal programming of policies and implementation plans.

It creates a situation in which individual policy goals and their relation to the final energy efficiency goals of the ESD are hard to define. The promotion of energy efficiency and the possibility to celebrate its successes will be much harder and more a matter of improvisation than planned actions.

The schedule for member states to submit their plan of action in Brussels does not coincide with the policy cycles in Member States. The Commission has established a new policy cycle, with the National Energy Efficiency Action Plans. It is logical that this policy cycle does not, from the start on, fit with the policy cycles in all Member States. Undoubtedly this will be streamlined all over Europe for the EEAP's of 2011 and 2014.

Another flaw in the ESD is that at the moment there is no certifying system for energy service companies. In fact every maintenance company can be self proclaimed ESCO without ever giving efficiency a thought.

It is left to the Member States, while at the same time CEN is working on models for harmonisation. At this point a clearer signal to the market would have given a useful tool for the (Dutch) ESCO market.

Furthermore, regulation on smart metering is lacking. There are no minimum requirements for smart meters, plus, with the liberalisation of the energy market, the metering market is liberalised too. So, one can freely switch energy supplier, also when this energy supplier has just recently installed a state of the art smart meter on the premises of the customer. The solution of the Dutch government, to declare the meter government property, is a very practical solution to this problem.

To achieve the 20 % reduction in greenhouse gases by 2020 stated in the EU document An Energy Policy for Europe (EC, 2007) more actions are needed. One important option, which lies beyond the scope of this paper, is to increase the efficiency of generating energy. Fuel substitution may provide an important contribution to CO<sub>2</sub> reduction, according to the ECN study (Daniëls 2006). In general, fuel switching from coal to gas is the most important option for the energy sector. This is also shown in Table 1. About 20 % of total energy consumption in the Netherlands is used for generating electricity. However, emission reduction is contrary here to both economic motives as well as motives of security of supply. After all, the world's supplies of coal are many times bigger than those of gas. So although the potential of this option (0.141 GJ) is almost twice that of other options, it does not seem probable that this path will be firmly taken. Therefore, other options are needed the more.

This paper focuses on the national measures that can be taken. The flexible Kyoto mechanisms and the option to use more nuclear energy will not be discussed in detail, as this is not within the scope of the ECEEE summer study.

## Abbreviations

ACEEE	American Council for an Energy-Efficient Economy
AER	General Energy Council
CDM	Clean Development Mechanism
CHP	Combined Heat and Power
COEN	EZ programme Consumers and Energy
DBO	Sustainable Operational Management for Governments
ECEEE	European Council for an Energy-Efficient Economy
ECN	Energy Research Centre of the Netherlands
ESD	Energy End-Use Efficiency and Energy Services Directive
EEAP	Energy Efficiency Action Plan
EMEEES	Evaluation and Monitoring for the EU Directive on Energy End-Use Efficiency and Energy Services
EOS	Energy Research Subsidy
EPBD	Energy Performance Building Directive
EPR	Temporary Subsidy Energy Efficiency
ESCO's	Energy Services Companies
ESD	The Energy End-Use Efficiency and Energy Services Directive
EU	European Union
EZ	Ministry of economical affairs of the Netherlands
IEA-DSM	International Energy Agency – Demand Side Management
IEE	Intelligent Energy Europe
JI	Joint Implementation
MAP	Environmental Action Plan
MIA/ Vamil	Environmental investments programme
NDA	National Designated Authority
NEPP	(Dutch) National Energy Policy Plan
NMP	(Dutch) National Environmental plan
VBTB	From Policy Preparation to Policy Audit
VROM	Ministry of Housing, Spatial Planning and the Environment
UNFCCC	United Nations Framework Convention on Climate Change

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