Evaluating the ESD and CHP Directive A methodology addressing multiple complexities and addressing various information sources

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Abstract

As part of the formulation of the proposed Energy Efficiency Directive an evaluation was made on the implementation and impacts of the Directive on end-use efficiency and energy services (ESD) as well on the CHP Directive on the promotion of cogeneration. Work to support this evaluation was split in an analysis on the demand side and one on the supply side of the market. For the demand side the issues evaluated regarded target setting, the set-up of the NEEAP¹, the exemplary role of the public sector, financing and funding, information to market actors and availability of audits. For the supply side the issues evaluated regarded the market for energy efficiency services, smart metering and informative billing, CHP and district heating & cooling. The paper describes the methodology developed and used for the evaluation, including a set of questionnaires to collect up-to-date information. The main part is devoted to the presentation of the findings per issue.²

Introduction

Energy efficiency and savings is -as reiterated by the Commission's working document 'the State of play'[EC, 2010] - the most immediate and cost-effective way of addressing the EU's strategic energy and climate policy objectives. These include fighting climate change, ensuring security of energy supply and establishing competitive and resource efficient economies. Ambitious so-called 20-20-20 targets³ were formulated in the integrated EU Climate and Energy package and binding objectives have been set for renewable energy and greenhouse gas reductions. However, no binding target was set for energy savings.

In order to realize the full potential of energy efficiency a series of directives and regulations were formulated by the EC. Among them the Directive on end-use efficiency and energy services (ESD, 2006/32/EC), which among others requested EU Member States to establish an indicative target for energy efficiency improvements. In addition, a Directive on promotion of cogeneration (CHP Directive, 2004/8/EC) was formulated to support high-efficiency cogeneration (HE-CHP) with the aim to achieve primary energy savings.

In the EU's Europe 2020 Strategy for smart, sustainable and inclusive growth the need for an overall energy savings policy was highlighted, including both the supply and demand side. To this end the implementation of the two Directives was evaluated for the European Commission. This mid-term assessment regarded a list of 15 aspects, as illustrated later in this paper (Table 1). Following the results of this evaluation we analysed the effects of policy options to enhance the impact of both Directives on energy saving and greenhouse gas reductions (see Boonekamp et al, 2011 and Voogt at al, 2011).

¹National Energy Efficiency Action Plan

² The paper is based on work for two projects for the European Commission, DG Energy. The sole responsibility for the content of this article lies with the authors. It does not represent the opinion of the European Communities nor can the European Commission be held responsible for any use that may be made of the information contained therein. ³ The 20 20 20 20 transfer for the European Communities nor can the European Commission be held responsible for any use that may be made of the information contained therein.

³ The 20-20-20 targets entail: saving 20% of the EU's total primary energy consumption, increase the share of renewable energy in EU final energy consumption by 20% and reducing the EU greenhouse gas emissions by 20%.

However, the paper restricts itself to the methodology used to conduct the evaluation of issues in the ESD and CHP Directives.

Complexity to the evaluation

Evaluation of EU Directives normally follows a standardised approach for which a methodology is provided by the EC impact assessment guidelines. This methodology distinguishes five main evaluation criteria:

- Relevance: has the specific provision of the Directive led to new or additional action beyond what was already happening in the Member States?
- Effectiveness: Have the actions following the specific provision contributed to the main goal(s) of the relevant Directive?
- Efficiency (cost-effectiveness): Were the results of the specific provision obtained at a reasonable cost?
- Utility: Do the impacts achieved correspond to the needs and the main goals of the relevant Directive?
- Sustainability: Will the effects achieved last beyond the period of implementation of the specific provision?

When evaluating the ESD and the CHP Directive we adapted the standardized approach for a number of reasons. Firstly, in an early stage of the evaluation we concluded that both Directives had been implemented with considerable delay and that their impact had been limited to date. Consequently existing data and experience were too sparse to fully rely on this methodology. Especially assessment of the criteria Utility and Sustainability was considered not possible.

Also lack of data prevented an appropriate assessment, especially for cost-effectiveness. Moreover, it was not quite clear whether costs regarded the costs for end-users, costs for government or costs for the society as a whole (see discussion in the ESD assessment [Boonekamp, 2011]).

Thirdly, both Directives have been formulated in a way that developments are stimulated rather than enforced. Several provisions left room for interpretation as a result of which the actual implementation has varied across EU Member States. Consequently we found it of absolute importance to analyse not only the fact whether provisions were implemented and whether it resulted in new policy measures, but also at the process of implementation, the market circumstances influencing the developments and whether target groups are addressed in such a way that investments or behaviour is structurally altered. In other words, we concluded that the methodology for evaluating the criterion relevance, effectiveness and efficiency should include elements of a process and market analysis.

Finally we concluded that especially for the measures identified in the ESD a considerable number of interactions exist with other provisions in the same Directive or provision from other EU level policies and with national policies. This policy interaction complicates identification of the resulting impacts of the specific Directive or provision, again limiting the use and value of the standard methodology. At the same time we believed that an in-depth understanding of these interactions was a necessity to understand the potential scope of impact of the Directives as well as to the identification of further measures required to achieve the targeted goals of the Directives. Following this analysis the set of evaluation criteria was extended with:

Interaction: Is there significant interaction between the specific provision and other policy at EU level? What is the nature of that interaction?

The applied evaluation methodology

Mechanism delivering savings

A first way of dealing with the complexities of the evaluation was the set up of a scheme that shows the mechanism whereby articles in the ESD directive ultimately lead to efficiency improvements or savings "on the ground". The general mechanism is shown in Figure 1; for each issue the mechanism was adapted to the specific situation. The general mechanism shows that a number of hurdles has to be taken before savings can emerge:

- the articles has to be transposed into national legislation
- this national legislation should not exist already to have an additional effect
- legislation should be followed by the actual implementation of policy measures
- policy measures should lead to actual saving measures
- saving measures should lead to real savings
- : the saving effect must be due to the article; if the savings are partly due to other policies a correction should be made.

For the first three hurdles a no or yes defines whether the ESD is relevant or not. At the fourth hurdle an outcome results in the form of saving measures taken, which results in savings and cost/benefits.



Figure 1. General mechanism, from ESD article to concrete effects for Member States

Three evaluation criteria mentioned earlier are present in the mechanism. The **relevance** follows from a comparison of the national legislation due to the articles and possibly already existing national legislation in member states. The **effectiveness** follows from the contribution of the savings, corrected for the influence of national policy measures, to the goal being the savings target. The **efficiency** follows from the ratio between the efforts in economic terms and the savings.

The added evaluation criterion "**interaction**" is also present in the scheme, between gross and net savings. Interaction can be present between ESD policy and other EU policy or between ESD policy and

national savings policy. In most cases interaction constitutes an overlap in the effect of the different policy types. Therefore, the gross savings can only partly be attributed to the ESD article, leading to lower net savings and restricting the effectiveness of the ESD policy. In some cases both policy types can reinforce each other's effect, e.g. in the case of EU labels for appliances and national subsidies for appliances with A-labels [Boonekamp, 2006]. In that case the net savings can be larger than the gross savings.

The interaction effect is especially true for horizontal ESD articles, which often stimulate supportive actions that do not directly lead to savings (e.g. mandatory audits), because other policies are needed as well (e.g. subsidies to implement measures from the audit). For the supply side elements there is strong interaction between the two Directives reviewed and other important energy and climate policies that influence the market opportunities for energy generation and production, such as the Renewable Energy Directive and the EU Emission Trading System.

Lacking data restrict the calculation of savings. Moreover interaction makes it difficult to attribute the savings to the specific ESD article and to determine the effectiveness and efficiency. For most issues at stake the evaluation runs only up to the outcome, e.g. the number of saving measures that are related to the ESD article.

Alternative three step evaluation approach

The complexities addressed in the previous section led to the development of a three-step evaluation approach. Step 1 follows the standardised approach of evaluation criteria and assessment of factual developments. Aims of this part of the analysis were to identify status of implementation of the relevant articles of the two Directives and their specific effect toward target achievement.

In steps 2 and 3 information from various stakeholders and experts was gathered to complete the factual assessment of step 1 as well as to make a detailed assessment of factors that have influenced the developments. A detailed set of indicators has been developed to support the evaluation, and a database was established to collect the results of the data gathering process. The data collection process followed the consecutive steps of the evaluation methodology.

Step 1 as said focuses on the factual developments The main indicators defined for this step 1 regarded the actual adoption of the legislation and its implementing measures at Member State level, the actual growth in the amount of energy efficiency services (e.g. audits executed), implemented saving measures and penetration rates, such as the share of HE-CHP in each country. Starting point for the analysis was the background material and administrative and technical files resulting from earlier studies and as made available by the Commission Services. In addition results were taken into account from studies under the Concerted Action ESD and the ChangeBest project, and from ongoing work from JRC on various matters. Data and publications from Member State governments and national statistics agencies were used to complement the information reported to the EC. Finally various existing peerreviewed literature as well as data sources from research institutes, industry organizations, etc. were collected for further completion of the database.

Steps 2 and 3 of the evaluation methodology address the main limitations to the factual analysis. Step 2 addresses the issue that a limited amount of information is published or recorded in statistics. This lack of information is taken up in the second step where questionnaires were developed and send to selected stakeholders in order to obtain further (semi-) official information. The main questionnaires were sent to EU Member State representatives, aiming to identify the latest status on implementation of legislative provisions and policy measures as well as to obtain further assessments on the results of these actions. Other questionnaires were sent to topic experts and to market actors. Step 3 addresses the issue that the observed trends do not necessarily link to successful implementation of legislation and/or policies but could also be the effect of specific market circumstances or developments. To this end the third step concentrates on obtaining expert knowledge from the team of researchers as well as from market participants, government bodies and other relevant stakeholders. It is important to realise that this expertise is often not based on scientific methodologies or peer-reviewed analysis, and often influenced by specific market circumstances or ruling legislatory framework. However, in a market where developments have only been limited and very recent it is exactly this type of information and the critical assessment thereof that identifies the opportunities for a change in the policy framework and the potentials for further uptake of energy efficiency services and HE-CHP. Information was gathered by means of interviews and own analysis. Interviews were held with selected market parties (e.g. energy companies and energy service companies) as well as topic experts to get a further understanding of the main subject matters, e.g. the uptake of policy requirements, the perceived barriers to the uptake of energy services and (for market parties) the flexibility of their business models to include energy services in their activities as a result of changes in the policy framework.

Specific assessment cases

The assessment focused on 16 issues that are included within a number of articles in the ESD and various aspects of the CHP directive (see Table 1).

Ne		lanua
NO.		Issue
	ESD	
1	Art.4	Target setting
2	Art.5	Exemplary role of Public Sector
3	Art.6	Energy companies promoting energy efficiency
4	Art.7(1)	Information dissemination by government
5	Art.7(2)	Incentives for market operators to provide more info/advice to final customers
6	Art.8	Qualification, certification and accreditation for EES providers
7	Art.9	Adequate financing for end-use saving measures
8	Art.10	Energy efficiency in transmission and distribution
9	Art.11	Establishment of funds for investments into savings
10	Art.12	Mandatory audits for industry
11	Art.13	Information on use through metering and billing
12	Art.14	NEEAP set-up of reporting
	CHP Directive	
13		Progress reports
14		CHP potentials
15		Barrier analysis
16		Guarantees of Origin for CHP electricity

Table 1. Overview of specific assessments of ESD articles and aspects of the CHP Directive

Results of the analysis for each ESD article⁴ and each aspect of the CHP Directive are shown in a number of tables. For reasons of space the results are grouped under "Implementation" (Figure 1, mechanism up to policy measures implemented) and "Impact" (the last part up to gross savings). The attribution to the ESD article (from net savings on) is not provided here, because results lacked normally.

⁴ Article 7 has been split into a demand side (government)and a supply side (energy company) issue

Table 2. Results of the evaluation of the ESD article 4, target setting

ESD, article 4: MS shall adopt and aim to achieve an overall national indicative energy savings target of 9% (of		
historic use), to be reached in 2016 by way of energy services and other energy efficiency improvement measures.		
Implementation	Impact	
Targets for 2016 have ben set in all MS. Seven MS	The impact could not be observed at the moment of the	
have a (slightly) higher target than the minimum of 9%	evaluation (begin 2011) as MS were still preparing the second	
asked for. Some MS expect more savings than their	NEEAP with data on realized savings. However, some rating of	
stated target.	the impact was possible, e.g. by looking at countries with	
	national targets being already higher, and for countries with	
	historic savings being much higher than the target. Moreover,	
	the erosion of the ESD target due to incorporation of early	
	action savings made the possible impact smaller.	

Table 3. Results of the evaluation of the ESD article 5, public sector role

ESD, article 5: MS shall ensure that the public sector fulfils an exemplary role, by taking measures at the appropriate national, regional and/or local level, enable the exchange of best practices between public sector bodies, and communicate them effectively to citizens and/or companies.

Implementation	Impact
The exemplary role regarded a choice of 2 out of 6	Although more procurement options were chosen than asked,
procurement options from the ESD; but also example	the impact could not be calculated at the moment of evalaution
actions and own savings targets were looked at. All	due to lack of data on savings thereoff. Based on the
MS have chosen at least two options (on average about	mechanism behind procurement the impact is seen as insecure
three), generally new for the country. Specific targets	due to the many deciding factors: the actual market
for the PS have been set by 12 MS, generally higher	transformation due to the public sector buying efficient
than the ESD target and sometimes rather ambitious.	devices. The impact of specific targets higer than that of the
For the uptake of example actions no data were	ESD was difficult to assess because it was often not clear
available.	whether they were already present before the ESD was adopted
	or due to the ESD. The impact of example actions was
	questioned because uptake by other energy users depends on
	successful communication, transferability of the public
	example actions and cost-effectiveness for commercial
	applications. Almost no monitoring results exists on these
	factors.

Table 4. Results of the evaluation of the ESD article 6, energy companies role

ESD, article 6: Member States have to ensure that energy companies promote energy efficiency and Member States		
have to address barriers to offering energy efficiency services		
Implementation	Impact	
The provision targets only energy companies, whereas	Impact of this article has been moderate. The wording of the	
market developments have shown that have also	provision leaves room for differences in interpretation,	
shown that other types of market actors such as the	resulting in uneven levels of ambition and in variations in the	
automation business are commercially interested in	timeframe of implementation across Member States. Markets	
taking up such services. Surveys and interviews	for energy efficiency services did not develop much. Energy	
suggest that the cost/benefit ratio (CBR) for energy	efficiency still plays a minor role in most energy companies,	
companies in general is insufficient (with the	except in those Member States in which energy companies	
exception of network operators in Denmark) and that	were obliged to achieve energy efficiency or energy saving	
for ESCOs this varies widely among national (and	targets. Besides the introduction of energy saving obligation	
regional) markets. The CBR seems most beneficial for	schemes in some Member States, little incentives were created	
companies that could use EES to enhance their	for market operators to enhance offerings on energy efficiency	
primary market activities. Examples are the	services.	
automation business that expands its market through		
EPC contracting and energy suppliers that support		

ESD, article 6: Member States have to ensure that end	ergy companies promote energy efficiency and Member States	
have to address barriers to offering energy efficiency services		
their supply offerings in public tenders		

Table 5. Results of the evaluation of the ESD article 7(1), information to market actors

ESD, article 7(1): MS shall ensure that information on energy efficiency mechanisms and financial and leg		
frameworks is transparent and widely disseminated to the relevant market actors.		
Implementation	Impact	
Dissemination regards a wide spectrum of information	Given the wide spectrum, lack of data and interaction with other	
forms, media types, various suppliers of information	policy the impact could not be calculated. But from the limited	
and very different receivers of information. Most MS	relevance (half of the MS had already so much policy on	
have policy measures in place on various forms of	information that they did not introduce any new measure) it is	
information dissemination (on average six). Some had	clear that the impact is often low. However, some countries	
very few at the moment of monitoring, which may be	launched the majority of information measures after the	
due to the short life time of e.g. information campaigns	introduction of the ESD, which could lead to an impact.	

Table 6. Results of the evaluation of the ESD article 7(2), information to final customers

ESD, article 7(2): Member States have to establish appropriate conditions and incentives for market operators to		
provide more information and advice to final customers on energy end-use efficiency.		
Implementation	Impact	
The provision triggered energy companies to provide	Achievements are small. Most MS opted for soft, non-	
more information but resulted in little energy saving	legislative demand-side measures such as information	
due to the general nature of the article and the limited	campaigns to the general public. Actions were mainly done by	
persuasiveness. Spendings were mainly targeted to	government agencies.	
information campaigns but public perception of the		
value of energy rationalisation is still low.		

Table 7. Results of the evaluation of the ESD article 8, QCA for energy service providers

m it necessary, the availability of appropriate qualification,
rs of energy services, energy audits and EEI measures.
Impact
It is not possible to rate the impact of these supporting
activities because the effect is dependent on many other policy
measures. Moreover, it not known how much saving measurs
are subject to QCA schemes

Table 8. Results of the evaluation of the ESD article 9, adequate financing

ESD, article 9: MS shall remove restrictive legislation and make model contracts for financial instruments available in the public and private sectors.

Implementation	Impact
According to the questionnaires no particular legal	The impact is limited for the removal of restrictive legislation
restrictions were present, so removal was not needed	which was not relevant for many MS. More than half the MS
Model contracts, like Energy Performance	did not have model contracts yet; in that sense there is a
Contracting, were available for half of countries, most	potential impact of the ESD. Adequate financing is not always,
of them already before 2007. Soft loans and financial	and in every MS or sector, a problem. For most of the old EU-
guarantee schemes and are present in part of the	15 states a first guess is that the impact of article 9 will be low.
countries.	For the new MS the impact seems relatively high as
	implementing the NEEAPs has facilitated EU subsidies.

Table 9. Results of the evaluation of the ESD article 10, network savings

ESD, article 10: Member States have to stimulate energy efficiency in transmission and distribution of energy (network		
operators) and remove barriers to this end.		
Implementation	Impact	
MS have attached different interpretations to the	Progress has been limited and uneven; barriers still remain that	
formulation of the Article and consequently implemen-	prevent further stimulation of energy efficiency in transmission	
tation has varied across MS. The article did provide a	and distribution.	
further incentive to selected MS for the removal of		
barriers to the implementation of EES. Tariff discounts		
for increased consumption still exist, but this is		
predominantly in commodity and capacity tariffs and		
not anymore in network tariffs. Strong interactions		
exist with the legislatory framework and proposal with		
respect to smart grids, and energy sector competition		
in general.		

Table 10. Results of the evaluation of the ESD article 11, funds for stimulating savings

ESD, article 11: MS may establish funds to subsidise the delivery of EEI measures and to promote the development of		
a market for EEI measures, such as energy auditing, financial instruments and informative billing. The funds shall also		
target end-use sectors with higher transaction costs and higher risks.		
Implementation	Impact	
For all MS together a substantial amount of new	The effectiveness of funding depends on access to financing,	
measures on funding (40%) has been introduced after	the focus of funding on specific targeted energy uses,	
the ESD came into force. These measures may be due	complementary commercial/public funding, national versus EU	
to the ESD, and show the relevance of the ESD for	funding and streamlining of schemes. Funding of Energy	
funding.	Efficiency Services (EES) can be effective through facilitating	
	the implementation of saving measures. Funding of audits and	
	programs is present in most of the countries. Most MS make	
	(some) use of EU funding, which complements national	
	funding.	

Table 11. Results of the evaluation of the ESD article 12, availability of audits

ESD, article 12: MS shall ensure the availability of high-quality energy audit schemes which are designed to		
identify potential EEI measures and which are carried out in an independent manner, to all final consumers.		
Implementation	Impact	
Policy measures on audits are present in almost all	Half of the policy measures on audits was introduced after the	
countries. Most regard mandatory audits but 20% is	adoption of the ESD, but many as part of the mandatory EPBD	
part of a voluntary agreement.	certification of buildings, which points at a modest impact.	
	Moreover, there is no impact if the follow-up of the audit is	
	hampered by lack of support for actual implementation of	
	measures.	

Table 12. Results of the evaluation of the ESD article 13, metering and billing

ESD, article 13: Member States have to ensure that consumers are provided understandable and accurate information on their actual energy consumption via individual meters that provide information on actual time of use and through their energy bills frequently enough to allow them to regulate their own energy consumption.

ESD, article 13: Member States have to ensure that consumers are provided understandable and accurate information on their actual energy consumption via individual meters that provide information on actual time of use and through their energy bills frequently enough to allow them to regulate their own energy consumption

then energy onis nequently enough to allow them to i	egulate then own energy consumption.
Implementation	Impact
Many MS have been late in implementing which did	No significant impact as a result of late implementation, too
not yet give the market sufficient time to respond. The	much room for interpretation, non-binding requirements and
provision left too much room for interpretation on key	low public perception on the value of energy rationalisation
aspects such as 'understandable', 'accurate' and	
'frequent', resulting in wide variation across MS and	
between network operators. Furthermore, public	
understanding on the value of rationalising energy	
remains low as a result of which improved imforma-	
tion does not result in significant reduction of energy	
demand. Strong interaction exists with (proposed)	
legislation on smart grids, data protection and the	
requirement formulated in the 3rd energy package that	
80% of final customers has to be equipped with smart	
meter systems by 2020.	

Table 13. Results of the evaluation of the ESD article 14, NEEAP reporting

ESD, article 14: MS shall submit to the Commission NEEAPs by June 2007, 2011 and 2014 that describe the EEI	
measures planned, the exemplary role of the public sector and provision of information and advice to final customers.	
include a thorough evaluation of the action plan and include results with regard to the energy savings targets.	
Implementation	Impact

Implementation	impact
All countries have submitted a NEEAP to the EC,	The impact of drawing up a NEEAP could not be determined
although sometimes with a delay of up to one year.	directly because possible savings from measures were not
Often there were shortcomings with regard to the	available yet (see target setting). However, the impact was
description of measures and the calculation of	assessed by looking to the role of the NEEAP in national
savings.	policy making. For countries with a comprehensive policy in
	place for years the impact is rated low. For countries where the
	NEEAP was the start of integrated policy making the possible
	impact was rated high. However, the actual impact depends on
	the effetiveness of policy making which could not be rated.
	Another indication of the impact of the NEEAP was the
	number of new policy measures introduced, which amounted to
	14% of all measures. However, some countries did not
	introduce new policy measures because they had already
	sufficient measures to meet the target.

Table 14. Results of the evaluation of the CHP Directive, progress reports

CHP directive, progress reports: Member States have to submit four-yearly progress reports on the development of	
СНР	
Implementation	Impact
Most MS were late in fulfilling their reporting	The progress reports did not trigger sufficient action to achieve
requirements and during this delay, market actors	the targeted growth of the CHP market, although the growth
postponed investment decisions in anticipation of	achieved differed between MS. It did enhance the
changes in the regulatory framework and supporting	understanding on CHP markets, its potentials and its barriers.
instruments. The reports did provide insight in	The non-binding nature did not sufficiently allow the
differences between understanding and	Commission to enforce further action at MS level.
implementation of the Directive and the further	
barriers to growing the market for high-efficiency	

CHP directive, progress reports: Member States have to submit four-yearly progress reports on the development of	
СНР	
CHP.	

Table 15. Results of the evaluation of the CHP Directive, analysis of potentials

CHP Directive, CHP potential: Member States have to analyse the technical and economic potentials for CHP	
Implementation	Impact
Analysis reports have been submitted, although most	The Directive does not require Member States to realise the
of them were later than required. All MS have made	estimated potential. Growth in CHP has been significantly less
an analysis, but as the Directive does not define how	than anticipated and the larger part of growth did not result
this analysis of potential should be carried out, each	from implementation of the CHP Directive.
national analysis has different depth, length and	
quality. Strong interaction exists with the EU ETS and	
the Industrial Emissions Directive, as these affect the	
operation of CHP units.	

Table 16. Results of the evaluation of the CHP Directive, barrier analysis

CHP Directive, barrier analysis: Member States should analyse the barriers to the wider deployment of CHP	
Implementation	Impact
All MS have implemented policy measures to support	Impact has been low. The barrier analysis translated into
high-efficient cogeneration, most of which did address	insufficient new measures to drive growth in the CHP market.
(some) market barriers. However, in most cases the	Existing barriers therefore often remain. Many of the barriers
barrier analysis served to justify existing policy. Only	identified related to the unfavourable economics of high-
few MS introduced new measures as a result, Strong	efficiency CHP compared to alternatives.
interaction exists with the EU-ETS and renewable	
energy legislatoin	

Table 17. Results of the evaluation of the CHP Directive, Guarantees of Origin

CHP Directive, Guarantees of Origin: Member States have to establish a Guarantees of Origin scheme for highefficiency CHP

Implementation	Impact
The system a system of guarantees of origin is not	The GoO requirement had a slight positive effect by providing
fully operational throughout the MS. MS did take up	a distinct market status of electricity from cogeneration.
measures to promote CHP. Strong interactions exist	However promotion measures of CHP were however
with the level of support provided for CHP, which	voluntary, as a result of which it did not significantly improve
creates the value to the GoO certificates. Further	the economic attractiveness of CHP compared to other
interaction exists with policies that affect the	investments.
competitive position of CHP versus other energy	
production technologies, such as the EU-ETS, and the	
Renewable Energy Directive.	

Overall conclusions

The standard procedure for the evaluation of EU policies looks into the criteria: relevance, effectiveness, efficiency (cost-effectiveness), utility and sustainability. In the assessment of 15 articles/aspects for the ESD and CHP directives this approach was only partially applicable for a number of practical reasons:

- The evaluation period 2008-2010 was (too) shortly after the formulation of the Directives, given the time needed for transposition of the Directives, development of national policy, set up of programmes and the emergence of actual efficiency improvements or savings;
- The content of a number of policies was not clear; Member States could choose between options (e.g. procurement) or the level of effort was left to the countries (dissemination of information);
- Several provisions left too much room for interpretation and were not of a nature to enforce actions. Consequently several policies also focused on supporting measures, such as audits or removal of legislative restrictions, having no direct relation with actual efficiency improvements or savings;
- The evaluation was executed before the countries had to deliver their second NEEAP, where they had to gather data on implemented measures and their impact⁵. Furthermore the market had little time to respond to the measures. The lack of information was partially addressed with questionnaires, but mainly for qualitative data.

Apart from these practical reasons a major problem was the interaction between the ESD and CHP policy and other EU policy, and with a large array of national policies. When different policy measures focus on the same targeted energy use, their combined effectiveness will often be lower than the sum of the separate effects. In some cases two different measures reinforce the other's effect, leading to an increased effectiveness. However, in all cases there is the problem of attributing an impact to a specific measure from the ESD or from the CHP Directive.

The problems described above could easily lead to the conclusion that the assessment of specific policies at only EU level is hardly possible. Here, the EU standard evaluation approach has been adapted in order to provide the maximum information still possible. In a process-type evaluation the mechanism, whereby ESD or CHP policy leads to efficiency improvements or savings "on the ground", was defined for each analysis case. This mechanism consist of a number of hurdles to be taken. In a three step approach data were gathered and analysed for the different hurdles, using every type of expert information available, including results from tailored questionnaires. The alternative method enabled to conclude on some of the criteria of the EU evaluation approach, such as relevance as to national policy implementation which indirectly defines effectiveness/impact.

Our evaluation concluded that on the whole the effect of both Directives has been limited to date. This was largely influenced by the short time for implementation, the room for interpretation given to countries, the market circumstances and the fact that both Directives are more of a stimulating nature than enforcing actions.

Our evaluation approach is an alternative in situations where the formulation of a policy framework does not automatically result in the implementation of adjacent policy measures and, if done, in the level of effort as meant in the policy framework. This situation exists for EU and its Member States and probably as well in international policy frameworks on e.g. emission reduction. However, this approach cannot solve the problem of determining effectiveness, or even efficiency, due to lack of data or interaction between many different policy measures.

⁵ The second NEEAPs now available would have facilitated the execution of the mid-term evaluation, but our impression is that recent data still lack and, if available, the attribution to the ESD articles is often not clear in the NEEAPs.

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