

# **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 NEEAP<sup>1</sup>, 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.<sup>2</sup>

### **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 targets<sup>3</sup> 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 et al, 2011).

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<sup>1</sup> National Energy Efficiency Action Plan

<sup>2</sup> 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.

<sup>3</sup> 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?

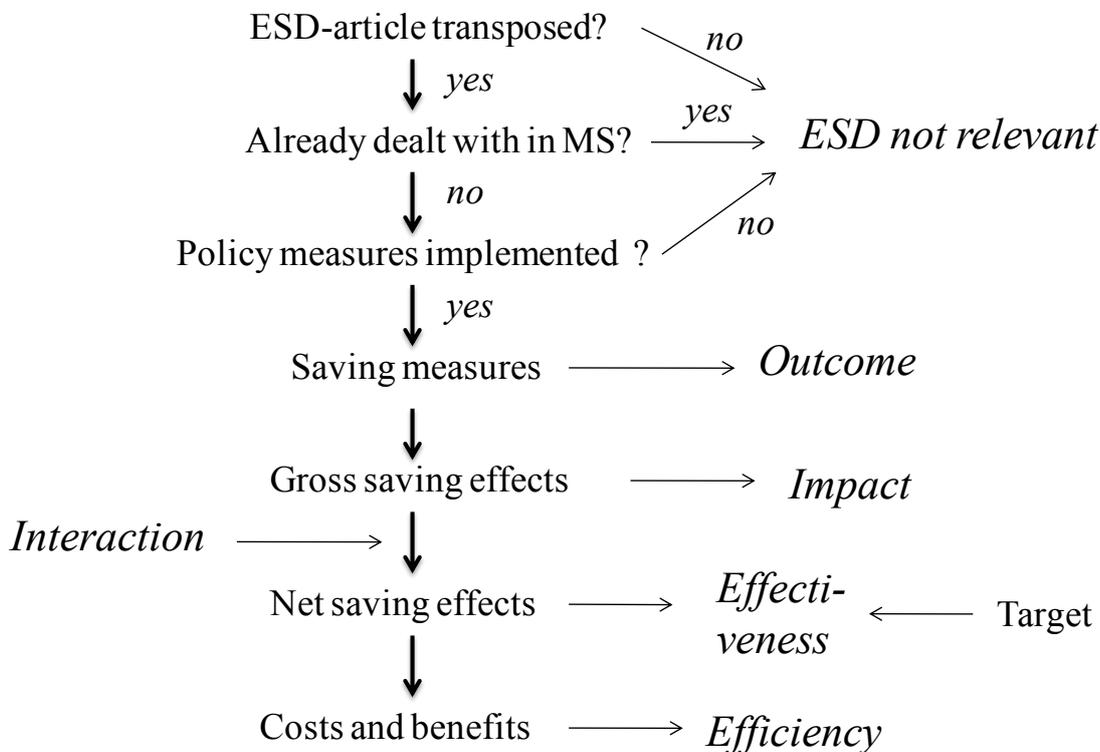
## **The applied evaluation methodology**

### *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 peer-reviewed 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 sent 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 legislative 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).

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

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

Results of the analysis for each ESD article<sup>4</sup> 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.

<sup>4</sup> 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**

<b>ESD, article 4:</b> 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.	
<u>Implementation</u>	<u>Impact</u>
Targets for 2016 have been set in all MS. Seven MS have a (slightly) higher target than the minimum of 9% asked for. Some MS expect more savings than their stated target.	The impact could not be observed at the moment of the evaluation (begin 2011) as MS were still preparing the second NEEAP with data on realized savings. However, some rating of 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**

<b>ESD, article 5:</b> 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.	
<u>Implementation</u>	<u>Impact</u>
The exemplary role regarded a choice of 2 out of 6 procurement options from the ESD; but also example actions and own savings targets were looked at. All MS have chosen at least two options (on average about three), generally new for the country. Specific targets for the PS have been set by 12 MS, generally higher than the ESD target and sometimes rather ambitious. For the uptake of example actions no data were available.	Although more procurement options were chosen than asked, the impact could not be calculated at the moment of evaluation due to lack of data on savings thereof. Based on the mechanism behind procurement the impact is seen as insecure due to the many deciding factors: the actual market transformation due to the public sector buying efficient devices. The impact of specific targets higher than that of the ESD was difficult to assess because it was often not clear 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 exist on these factors.

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

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

<b>ESD, article 6:</b> Member States have to ensure that energy 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**

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

<b>ESD, article 7(2):</b> 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.	
<u>Implementation</u> The provision triggered energy companies to provide more information but resulted in little energy saving due to the general nature of the article and the limited persuasiveness. Spendings were mainly targeted to information campaigns but public perception of the value of energy rationalisation is still low.	<u>Impact</u> Achievements are small. Most MS opted for soft, non-legislative demand-side measures such as information campaigns to the general public. Actions were mainly done by government agencies.

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

<b>ESD, article 8:</b> MS shall ensure, where they deem it necessary, the availability of appropriate qualification, accreditation and/or certification schemes for providers of energy services, energy audits and EEI measures.	
<u>Implementation</u> Qualification for providing Energy Efficiency Services (EES) is more wide spread than certification (labeling the quality) and even more than accreditation (checking the labeling).	<u>Impact</u> 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 measures are subject to QCA schemes

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

<b>ESD, article 9:</b> MS shall remove restrictive legislation and make model contracts for financial instruments available in the public and private sectors.	
<u>Implementation</u> According to the questionnaires no particular legal restrictions were present, so removal was not needed Model contracts, like Energy Performance Contracting, were available for half of countries, most of them already before 2007. Soft loans and financial guarantee schemes and are present in part of the countries.	<u>Impact</u> The impact is limited for the removal of restrictive legislation which was not relevant for many MS. More than half the MS did not have model contracts yet; in that sense there is a potential impact of the ESD. Adequate financing is not always, and in every MS or sector, a problem. For most of the old EU-15 states a first guess is that the impact of article 9 will be low. 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**

<b>ESD, article 10:</b> Member States have to stimulate energy efficiency in transmission and distribution of energy (network operators) and remove barriers to this end.	
<u>Implementation</u> MS have attached different interpretations to the formulation of the Article and consequently implementation has varied across MS. The article did provide a 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 legislative framework and proposal with respect to smart grids, and energy sector competition in general.	<u>Impact</u> Progress has been limited and uneven; barriers still remain that prevent further stimulation of energy efficiency in transmission and distribution.

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

<b>ESD, article 11:</b> 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.	
<u>Implementation</u> For all MS together a substantial amount of new measures on funding (40%) has been introduced after the ESD came into force. These measures may be due to the ESD, and show the relevance of the ESD for funding.	<u>Impact</u> The effectiveness of funding depends on access to financing, the focus of funding on specific targeted energy uses, complementary commercial/public funding, national versus EU funding and streamlining of schemes. Funding of Energy 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**

<b>ESD, article 12:</b> 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.	
<u>Implementation</u> Policy measures on audits are present in almost all countries. Most regard mandatory audits but 20% is part of a voluntary agreement.	<u>Impact</u> Half of the policy measures on audits was introduced after the adoption of the ESD, but many as part of the mandatory EPBD 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**

<b>ESD, article 13:</b> 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.	
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<b>ESD, article 13:</b> 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.	
<u>Implementation</u> Many MS have been late in implementing which did not yet give the market sufficient time to respond. The provision left too much room for interpretation on key 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 information 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.	<u>Impact</u> No significant impact as a result of late implementation, too much room for interpretation, non-binding requirements and low public perception on the value of energy rationalisation

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

<b>ESD, article 14:</b> 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.	
<u>Implementation</u> All countries have submitted a NEEAP to the EC, although sometimes with a delay of up to one year. Often there were shortcomings with regard to the description of measures and the calculation of savings.	<u>Impact</u> The impact of drawing up a NEEAP could not be determined directly because possible savings from measures were not available yet (see target setting). However, the impact was assessed by looking to the role of the NEEAP in national 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 effectiveness 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

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

<b>CHP directive, progress reports:</b> Member States have to submit four-yearly progress reports on the development of CHP
CHP.

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

<b>CHP Directive, CHP potential:</b> Member States have to analyse the technical and economic potentials for CHP	
<u>Implementation</u> Analysis reports have been submitted, although most of them were later than required. All MS have made an analysis, but as the Directive does not define how this analysis of potential should be carried out, each 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.	<u>Impact</u> The Directive does not require Member States to realise the estimated potential. Growth in CHP has been significantly less than anticipated and the larger part of growth did not result from implementation of the CHP Directive.

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

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

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

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

## 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 impact<sup>5</sup>. 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.

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<sup>5</sup> 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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