

‘Building’ Energy Efficiency Action Plans: balancing what the Commission wants with what Member States can do

Anson Wu
Association for the Conservation of Energy
London, United Kingdom
anson@ukace.org

Pedro Guertler
Association for the Conservation of Energy
London, United Kingdom
pedro@ukace.org

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Abstract

The Energy End-use Efficiency Energy Services Directive requires all Member States to submit energy efficiency action plans that outline their strategy to increase energy efficiency. To ensure the plans fulfil this role, this paper analyses the key elements needed for a template and guidance, tailored specifically to the buildings sector. Adapted from the Global Reporting Initiative reporting guidelines, the key principals are identified which fulfil the central purpose of the Plan – enabling the European Commission to examine progress towards the Directive’s 9 per cent energy saving target. The detailed structure and content can then be identified from the Directive and an international range of existing energy and climate change action plans. Using these principles, the details included within each plan are assessed for relevance and importance. These results are then compared against expert opinion, which includes a rating to establish how difficult including each detail in a template might be. A final assessment and ranking of the details required in an ideal template is then produced. By doing so, the template balances the requirements of the European Commission and administrative burden to Member States and therefore provides practical advice about prioritising particular details as well as guidance for developing new programmes and policies to fulfil the Directive.

Introduction

This paper draws upon work undertaken by the Association for the Conservation of Energy to create a template for Member States’ Energy Efficiency Action Plan (EEAP), targeted specifically at the buildings sector (Guertler and Wu, 2007). EEAPs are required by Article 14 of the EU End-use Efficiency and Energy Services Directive (ESD) that describe how a Member State proposes to meet its 9 % energy saving target. This paper explores the use of the Global Reporting Initiative’s (GRI) Reporting Guidelines for sustainability reports (SR) and how it can be informally applied to ensure higher quality reporting in a more specific, narrowly defined instance.

Sustainability reporting is rarely undertaken in the public sector where there is a lack of understanding (Dickinson et al, 2005), but it is becoming standard practice for larger companies with all FTSE 100 companies now having some non-financial reporting (Corporate Register 2006). However, public agencies that do so believe it allows them to monitor and set future strategies against their targets (Dickinson et al 2005). This is closely in line with GRI’s rationale in which the public sector is used to reporting performance of policies but rarely reports on the internal performance of the organisation (GRI 2006).

Greater focus on the organisations and the implementation of the policies is in line with the European Commission’s focus on best practice and full implementation of existing European legislation, and the reason for using the GRI reporting guidelines to create the EEAP template. GRI G3 guidelines were also widely perceived as best practice by Public Agencies (Dickinson et al 2005). Furthermore, the sustainability reporting guidelines create an extensible framework. This will enable future expansion of the reports to account for wider sustainability issues,

and if other reports adopt a similar structure can help reports to be fitted together in a coherent fashion to create a full SR.

The Directive, however, does not require a full SR and to do so would increase the administrative burden on member states whilst not fulfilling the Commission's requirements. By reinterpreting the guidelines the aim is to produce an efficient report that meets the European Commission's requirements with minimum administrative burden and therefore balances the needs of the Commission and Member States.

Methodology

The research was carried out in three stages. The first stage was to assess the needs of the Commission through the analysis of the text of the ESD, both its strict interpretation and its spirit. This is a straightforward desk exercise and was followed by splitting the ESD text into the ten reporting principles (Table 1). From this it was possible to identify the principles that were most relevant and needed examining carefully, based on the requirements of the ESD. The important principles were then applied, in the second stage, to current energy policy documents to test the quality and to assess the content. This was based on a qualitative assessment using the tests in the GRI reporting guidelines.

The final stage was to create an initial template and to test it using feedback from the EC and member states, the two key stakeholder groups. This feedback was used to balance the needs of the member states by limiting the administrative burden whilst capturing all the most important information from the first two stages. A questionnaire was sent to all the officials across the European Union responsible for implementing the ESD and the Energy Performance of Buildings Directive for their professional judgement. The responses were used to rank the importance and difficulty of providing the information. Follow up interviews were then used to understand the rationale of the rating and the weaknesses in both the ESD and the template. The final template (Figure 1) takes into account the feedback, removing unnecessary detail, altering the order of reporting and splitting the content into core and additional information.

Overview and Initial Application of the Guidelines to the Directive

The Energy End-use Efficiency and Energy Services Directive (ESD), introduced on 5 April 2006, requires all Member States to "aim to achieve an overall energy savings target of 9 %" over nine years. This is split into three periods and each member state must set an efficiency target and detail plans to do so in their EEAP. Article 14 – Reporting – sets this timetable for submitting EEAPs, the first of which must be submitted by 30 June 2007.

"All EEAPs shall describe the energy efficiency improvement measures planned to reach the targets set out in Article 4(1) and (2), as well as to comply with the provisions on the exemplary role of the public sector and provision of information and advice to final customers set out in Articles 5(1) and 7(2) respectively."

The improvement measures are not restricted and can include sector specific measures, cross-sectoral measures, and

Table 1. GRI reporting principles

| Principles for defining report content | Principles for ensuring report quality |
|--|--|
| Materiality | Balance |
| Stakeholder inclusiveness | Clarity |
| Sustainability context | Accuracy |
| Completeness | Timeliness |
| | Comparability |
| | Reliability |

horizontal measures. As a result the template must be capable of encapsulating all possible measures across all the Member States without being over-complicated or over-simplistic.

The ESD needs were interpreted from two perspectives: strict legal compliance, and the wider context and spirit of the Directive. In line with this, the principles can be grouped into those which are well defined, and those weakly defined by the Directive. The well defined group contains the principles where the Directive contains strict requirements, such as timeliness of the reporting. In the weakly defined group are the principles for which the requirements have greater flexibility, or the Directive does not meet the GRI principles. This is not a weakness in the Directive but a necessary limit in the Directive's scope. However, in the weakly defined group is greater interest and greater importance to the outcomes of this research.

WELL DEFINED REQUIREMENTS

Stakeholder inclusiveness requires all the stakeholders be identified and all reporting explains how their expectations and interests have been addressed. Because the ESD's aim is to transform the energy market, and everyone consumes energy, everyone is stakeholder. However, including this in the EEAP will make the report too unwieldy for its primary and specific purpose. In this case the major stakeholder is the Commission but we must recommend similar information is reported to the other stakeholders, such as through national energy policy strategies or similar documents.

Sustainability context places the performance in wider context such as other country's targets and global pollution loads. The sustainability context is set by the 9 % national target and the 20 % by 2020 target in the EC Action Plan on Energy Efficiency. Quantifying these targets will require some baseline energy consumption trends but not any forecasts.

Timely reporting occurs on a regular schedule and allows the stakeholder to make informed decisions. This is clearly defined to be three reports submitted by 30 June 2007, 2011, and 2014. However, it is worthwhile to consider when other stakeholders will require reports, particularly those implementing the programmes and policies described in the EEAP.

WEAKLY DEFINED REQUIREMENTS

Materiality should cover all the 'significant impacts' in the triple bottom line – economic, environmental and social impacts – that 'substantively influence' the stakeholder decisions. In the ESD the overriding impact is to reduce energy use through energy saving programmes and measures, and must be given the most prominence. The energy use will be reduced by developing the market for energy services, and financial and funding mechanisms. These have economic impacts and the Directive states these must be "financially reasonable" (Article 13, para 1.)

to qualify the legal requirements. Therefore, reporting must include economic impacts: costs, savings, and also the stakeholders affected, including the public agencies. In line with the energy saving goal, climate change is the main environmental impact. The Directive does not address any other impacts except in paragraph 15 of the preamble, “When striving for energy efficiency on the basis of technological, behavioural and/or economic changes, substantive negative environmental impact should be avoided and social priorities respected”.

Completeness is the combination of scope (indicators), boundary (entities whose performance is reported) and time that ensures all the significant information needed to assess performance is included. It is the balance to materiality which ensures that irrelevant information is excluded.

Comparability over time and between member states is particularly important to the Directive because the Commission is also committed to reporting back on the best practice, assess progress, make recommendations, and publish a full cost-benefit impact assessment examining linkages between the various measures and programmes which are used in attaining the 9 % target.

Balance ensures both positive and negative results are reported and weighted proportionately to reflect overall performance. This is important to explain the rationale of a programme and the where effort is focused, particularly for future adjustments. **Clarity** is the ease with which the stakeholders are able to find and understand the report to serve their needs. This complements strongly with comparability and is essential given the number of reports the Commission must assess with limited resources. Both of these are also considered when developing the template.

PRINCIPLES BEYOND THE SCOPE OF THIS PAPER

It was not possible to cover all aspects of the EEAP, some of which are being addressed by separate studies and some of which are outside the control of the template. Included in this are the indicators used to measure performance which will be standardised by the Commission and will have a significant effect on the **accuracy** and **reliability** of the report.

In summary, the well defined requirements need not be investigated, whilst the principles beyond the scope of the paper cannot. The main topics of analysis are therefore the less well defined requirements because these leave greatest room for interpretation and hence potentially lead to inconsistent quality between reports. These can be broken down into the content, in terms of **materiality** and **completeness**, and the quality, in terms of **comparability**, **clarity** and **balance**.

Testing current reports against the principles

The original research was carried out by analysing 17 reports from ten countries, including eight member states. However, this paper will focus on just five representative reports which were analysed for their weaknesses and the strongest features compiled to create a draft template. The reports were from the United Kingdom, New Zealand, USA, Denmark and the Czech Republic. All were energy efficiency action plans except the Czech climate change plan. It was deemed particularly important to study reports from outside the European Union as

there is a perception that there needs to be greater international cooperation in the field of energy efficiency (Goldstein, 2006).

The general structure of the report could be broken down into two main parts. The introductory part included a statement of commitment and vision by the lead agency or minister and a breakdown of the baseline performance and a summary of the expected improvements. These fulfilled the well defined, stakeholder inclusiveness and sustainability context requirements. The second part describes the actions that are planned or have been implemented.

The individual action plans are discussed in respect to the GRI principles and summarised in Table 2.

UK. Energy Efficiency: The Government's Plan for Action

The UK plan described policies by sub sector and policy by policy but then changed to an objective-based breakdown. The information provided about each policy was not always the same and showed some inconsistency; it did not follow a very rigid structure, with no sub headings for each policy description, but could sometimes be very detailed. Whilst there was a section describing delivery and the “balance of instruments”, there was no allocation of effort or budgets, or timeframe. One of its strengths was its reporting on previous efforts and progress to date, with some rationale for the plan's approach.

New Zealand Energy Efficiency and Conservation Strategy

The New Zealand plan focused on different objectives and barriers by using sub-headings to explain how it will be achieved. The headings were clear and covered the key areas: lead agency, delivery, description, rationale, targets, indicative impacts. A table followed explaining the policies which are to be implemented and the timeframe for doing so. This structure made the information easier to find and compare, but it lacked the level of detail sometimes found in other reports. For example, it is unique in stating very clearly who the lead agency will be, but does not give any information about the other organisations involved. An objective-based report also makes it more difficult to assess individual programmes since the information is then scattered through the report. However, it made extensive use of appendices to explain further.

Denmark. Action Plan for Renewed Energy Conservation

The Danish action plan was an unofficial translation and therefore more difficult to comment on its structure. It is similar to the UK report in that there was no clear structure for the reporting, choosing instead to use continuous prose. Key information was given in highlighted boxes but the impacts and actions were not standardised across the report, and therefore, it was not possible to compare the impact in real energy savings between programmes. It did have the benefit of being the shortest report.

Czech Republic. National Programme for the Energy Effective Management

The Czech plan for energy management had a greater focus on energy production than reducing demand. It had the most baseline analysis in terms of economic and energy saving potential – which forms a strong basis for explaining the rationale of a programme. The current legislative background was also analysed, including on aspects such as air pollution. It also

Table 2. Comparison of energy policy documents against GRI guidelines

| | | UK | NZ | DK | USA | CZ |
|----------------|----------------------|--|--|--|--|---|
| Content | Materiality | Yes – strong on previous actions and social aspects | Yes – strong on general rationale and explanation | Yes | Yes – strong on analysis of measures and programmes | Yes – strong on analysis of baseline energy and overview of legislative situation |
| | Completeness | Did not include information on implementation and costs | Covered all areas but with insufficient detail | Did not calculate cumulative energy savings or costs; responsible organisations not given | n/a – is not a plan of action | Very little information on programmes - costs, savings or implementation |
| Quality | Balance | Discloses positive and negative results | No reporting of previous accomplishment | No reporting of previous efforts | Discusses all possible measures including advantages and disadvantages | Does not disclose success of previous legislation despite overview |
| | Clarity | Programmes broken down into sub-sectors. Each programme uses continuous text; difficult to find information | Easy to find information, and clearly and simply written | Key information is highlighted in boxes; otherwise poor use of headings and titles to breakdown text | Very technical language but extensive use of headings and figures | Clear, consistent use of headings; contents page was inadequate |
| | Comparability | Some reporting of previous work; difficult to compare between programmes, inconsistent details and no common indicator | No report of success of previous efforts. Each programme is comparable within the doc Reporting uses same indicator throughout | No report of previous programmes Programmes and actions do not use common indicator | Measures were all analysed in similar manner | Measures were not analysed, making comparability impossible. |

clearly stated the goals of the plan and was structured by objective. However, there was very little detail about the programmes and policies which would be set in place, simply listing legislation or amendments to be carried out. Therefore it would be impossible to judge whether the legislation could be enforced and would achieve its objective.

USA. National Action Plan for Energy Efficiency

The US action plan was very different because it was written mainly by industry. This allowed it to include extremely detailed economic analysis about the types of possible measures and programmes, from a stakeholder perspective. It is more like a manual for implementing actions rather than an actual plan of attack. This is likely because the actions must be implemented by each state, which covers a very diverse range of groups.

Summary of existing reports content

Defining the report content, based on the principles of materiality and completeness, is the most difficult factor to balance. It is very easy to demand more and more detail to cover every possible situation. This also multiplies exponentially, as you drill deeper and deeper down, which risks confusing the reader and the template user. From the existing reports it was clear that the information was material but rarely complete. This was because the reports had often been created simply for interested parties, rather than a clear stakeholder(s). The exception was the US plan which, although inappropriate as an EEAP, highlighted the amount of information that was not included in the other reports. One solution is to consult the stakeholders before producing a report, and was the route taken to create the

template. However, at this stage it is possible to define the key groups of information:

- Description – the general approach and aims of the programme
- Performance – the energy savings framed against the wider targets and potential
- Costs – how much the programme will cost, in as much detail as possible
- Delivery – How the Member State has prepared to ensure the programme performs successfully
- Legislative fulfilment – legislation introduced and how the programme fulfils the ESD

Summary of existing reports quality

Report quality varied widely and, again, was most likely a result of the different stakeholders they were addressing. Furthermore, it was unclear who the stakeholder was so we must assume it was the ill-defined group of 'interested' parties. The NZ report was generally of higher quality than other countries. With the exception of the UK there was little to no reporting of previous efforts, even when a country had made earlier action plans. This is necessary to explain the rationale of a programme when best practice is of particular interest to the Commission and is therefore made explicit in the template. Internal consistency within a report and general clarity was poor in many cases, except NZ. Reports were also difficult to compare internally and against each other. Therefore, a more rigid template with a large number of headings was recommended.

| Introduction | | | | |
|--|--|-------------|------------|-------|
| Target timeframe | Target savings | | | Total |
| | Public | Residential | Commercial | |
| Statement of commitment to energy saving target | <i>Written statement giving an overview of the programmes.</i> | | | |
| Saving target for interim 3yr period | <i>Each target to be explicitly stated for each building sector and expressed in common unit (GWh)</i> | | | |
| 9%, minimum target required by ESD | | | | |
| Overall saving target and full energy saving potential by 2020 | | | | |
| Savings from additional programmes | | | | |
| What is the current/baseline energy consumption | | | | |

Figure 1 Ideal EEAP template content and structure for the buildings sector.
Part 1 – Introduction

| Compliance with Energy Performance of Buildings Directive | | | | |
|---|---|--|--|---|
| EPBD Articles | Legislation | | | |
| §3 Adoption of a methodology | <i>Name of the legislation introduced or amended to transpose the requirements of each EPBD article</i> | | | |
| §4 Setting of energy performance requirements | | | | |
| §5 New buildings | | | | |
| §6 Existing buildings | | | | |
| §7 Energy performance certificates | | | | |
| §8 Inspection of boilers | | | | |
| §9 Inspection of air conditioning systems | | | | |
| §10 Independent experts | | | | |
| §13 Review and adaptation of the framework | | | | |
| §15 Transposition | | | | |
| Articles of the Energy End-use Efficiency and Energy Services Directive | | | Existing programmes/legislation | Planned programmes |
| §4 General target | | | <i>Legislation/programmes already in place</i> | <i>New legislation/programmes to be introduced to fulfil ESD articles</i> |
| §5 Energy end-use efficiency in the public sector | | | | |
| §6 Energy distributors, distribution system operators and retail energy sales companies | | | | |
| §7 Availability of information | | | | |
| §8 Availability of qualification, accreditation and certification schemes | | | | |
| §9 Financial instruments for energy savings | | | | |
| §10 Energy efficient tariffs and other regulations for netbound energy | | | | |
| §11 Funds and funding mechanisms | | | | |
| §12 Energy audits | | | | |
| §13 Metering and informative billing of energy consumption | | | | |
| §14 Reports | | | | |
| §15 Review and adaptation of the framework | | | | |
| §18 Transposition | | | | |

Part 2 – Compliance with Legislation

The proposed ‘ideal’ content for the EEAP

Based upon the analysis of the content of other reports and feedback from the two main stakeholders – the Commission and national officials responsible for the implementation of the ESD as well as the EPBD, an ideal template was proposed. The items in bold are considered the core details, essential to ensure the quality of the report whilst the details not in bold are additional. In line with reporting guidelines, it is recommended that more information should be produced in future when capacity and capability increases. The proposed template format is given in Figure 1. Because the focus of the research is on the buildings sector, the EPBD compliance is also listed in the template.

Part 1 gives the introductory information as before, Part 2 is the legislative fulfilment and Part 3 forms the main body of the report that must be repeated for each programme or policy contributing towards the 9 % target that is proposed or in place. The headings follow the loose categories of description, performance, cost, and delivery which confirms and supports the desk research with the professional opinion. Creating two levels of information also graduates the completeness and materiality of the information beyond a simple black and white.

Whilst all the information under each heading would be included in an ideal report, for programmes and policies which have not been fully developed, this is clearly not possible. Instead the time it will be reported should be included

| Building energy efficiency programme or policy (required for each) | | |
|--|--|--|
| Required details | | Explanation of details |
| a. | Name | <i>Name of the programme</i> |
| b. | Type of programme | <i>Financial/non-financial Push/Pull etc</i> |
| c. | Buildings sector(s) it affects | <i>Public/residential/commercial</i> |
| d. | Other, non-building sectors it affects | <i>Potentially transport and/or industrial</i> |
| e. | Historical background to programme | <i>If provided, should be in appendix</i> |
| f. | Measures applied | <i>Whether it is technology and/or information based</i> |
| g. | Barriers tackled | <i>If provided, should be in appendix</i> |
| h. | Potential energy savings | <i>The amount of energy that could potentially be saved from the measures this programme promotes (both technical and cost-effective)</i> |
| i. | Expected/actual energy savings | <i>Expressed in GWh and CO₂e; will overlap with timeframe (i.e. how much it will save by different dates); must include how much it will save by 2007, 2010, 2013 and 2020</i> |
| j. | Target end-users | <i>Which groups of end-users pocket the gains from the energy savings, eg socio-economic group, type of business</i> |
| k. | Full cost benefit analysis | <i>If provided, should be in appendix</i> |
| l. | Programme cost | <i>Must be a standardised indicator – Euro/kWh saved</i> |
| m. | Bearers of cost | <i>Which key stakeholders bear the cost of installing the measures and running the programme</i> |
| n. | Timeframe | <i>Start date, duration of programme. Should also reflect key dates: 2007, 2010, 2013, and 2020.</i> |
| o. | Wider context/auxiliary benefits | <i>If provided, should be in appendix; should include reporting on e.g. job creation and health improvement, and who benefits</i> |
| p. | Examples/case studies | <i>If provided, should be in appendix; more important for the 2nd and 3rd EEAP</i> |
| q. | Reasons alternative programmes were rejected/unsuitable | <i>If provided, should be in appendix</i> |
| r. | Legislative framework | <i>What primary and secondary legislation (if any) has been introduced for the programme</i> |
| s. | Stakeholder responsible for delivering each part of an activity | <i>Should include at least the responsible ministry, but also agencies (e.g. non-departmental public bodies), and building sector stakeholders whose involvement is required</i> |
| t. | Enforcement - penalties for failure to comply | <i>With the Commission's strong focus in the EU EEAP on ensuring existing legislation is properly implemented and enforced, this becomes a crucial component of the EEAPs</i> |
| u. | Programme delivery infrastructure | <i>This should explain how the main stakeholders interact; it can go into the appendix</i> |
| v. | Monitoring/ measurement | <i>This should make reference to the calculation methodology the Commission is developing, and elaborate in detail on the measurement methodology, the assumptions it makes, including whether it is bottom-up, top-down (or both), frequency of measurement, which data is assumed and which is real (i.e. reliability of data). This part of the template is crucial for the Commission to assess the reliability of the reported energy savings</i> |

Part 3 – Main body for policy or programme analysis

in the timeframe. Conversely, for programmes that are already running, more information such as a full cost benefit analysis should be demanded by the Commission.

The report quality is raised simply by instructing the member states which headings must be covered *for every programme* in the EEAP, in a consistent manner – as is shown in Part 3.

Conclusions

Using reporting principles to assess requirements

By breaking down the requirements of the Directive using the GRI guidelines, the template contents could be defined with a high level of confidence that it meets the requirements of the Commission. Separating the problem into content and quality provides a very useful focus for considering the overall template. Greater emphasis on the stakeholder requirements is also crucial for the template, which was poor in the current plans reviewed.

The responses from officials also ensured it would not place an undue administrative burden on the member states. Furthermore, for some member states who had not started their plans at the time of the research, during interviews they stated that the template would assist them in developing their overall EEAP and choosing programmes.

This does not mean, however, that it fulfils the requirements of a good sustainability report. Instead, the content covered is of high quality and demonstrates the principles needed for expanding it into, or including it in a sustainability report, once the omissions are addressed. In addition, whilst the results of this are beneficial, by independently carrying out this work, a major goal of the GRI – to internalise its principles is lost. This will hinder future reporting developments since they are not aware of the reporting principles and the content that has been omitted.

Using reporting principles to assess weaknesses

Through the interviews, the research also highlighted the weaknesses in the ESD's emphasis on reporting energy savings over the (relatively short) three to nine-year period, which could create a number of problems for long-term energy efficiency programmes identified by stakeholders. For example, the concern was raised that this may shift bias in the EEAPs away from research and development support programmes, and activities such as financing technologies to market, a strength of the Swedish Government's innovation network (de Lussanet, 2006). Conversely it can be argued that less cost-effective programmes which are quick to produce energy savings, such as subsidies on energy saving products, may receive undue bias in the EEAPs due to the ESD's timescales. This in turn could shift resources away from long-term initiatives that have less immediately tangible results.

Long term programmes are also preferred by industry because it gives firms increased certainty about the development of their markets, so facilitating timely investment. The Danish building code, for example, has announced standards until 2015 and despite concerns by government it was welcomed by industry (Bach, 2006).

The ESD's reporting requirements also fails to suitably take into account the ancillary benefits and effects of the programmes such as climate change adaptation, or quality of life indicators. This can often have very large effects on the cost-effectiveness of a programme. Long term health physiological and mental benefits from better quality housing and indoor environment, which reduces burden on health services and increases economic productivity, are also overlooked and not quantified. Climate change adaptation, could cause perverse impacts on future energy use and building comfort. The most obvious example is rising temperature coupled with national programmes that installed higher levels of insulation exacerbating overheating and forcing occupants to install air conditioning or even suffer from medical problems.

Recommendations for applying the template

Informally applying GRI reporting principles can improve the quality of energy efficiency action plans and in turn should give both member states and the European Commission confidence that the 9 % energy saving target will be achieved. However, the current state of cultural, climatic and energy efficiency policy

must be taken into account when assessing an individual action plan. For these reasons, this template is more valuable to the new member states than those with established systems. It is also hoped that by highlighting possible weaknesses of the template and the target, when viewed in light of the spirit of the Directive, the application of reporting guidelines can influence the choice and development of energy efficiency programmes in future with greater consideration for their ancillary benefits and longer term energy saving goals.

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