

A European Tracking System for Electricity (E-TRACK)

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Consultation document for the Advisory Group and the second round of consultation workshops

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Content

1	Introduction.....	2
2	Evaluation criteria for tracking options	3
3	Three alternative tracking options.....	5
3.1	Option A: "Ex post contract tracking".....	5
3.2	Option B: "Voluntary certificate system plus residual mix"	8
3.3	Option C: "Ambitious certificate system"	10
4	Draft recommendation for a harmonised tracking system	13
5	Main cost drivers for tracking options	15
6	Next steps in the E-TRACK project.....	17
	Annex	18

1 Introduction

The major objective of the E-TRACK project is to draft a harmonised standard for tracking electricity generation attributes in Europe. Such tracking is required for electricity disclosure and other policies in the Internal Market for Energy.

The focus of the third meeting of the E-TRACK Advisory Group and of the second round of consultation workshops within the project will be the non-technical specifications of the tracking schemes. These comprise the general set-up of the tracking scheme. The meetings will not address technical details such as data structures or interfaces between registries. This is the subject of work package 4, which will build upon the results of this round of consultations.

Also, the analysis of cost and benefits of tracking options in work package 5 of the E-TRACK project is still under way. A list of major cost drivers is included in section 5 of this document. Further analysis of the cost and benefits depends on the results of a questionnaire survey among stakeholders, which are currently being analysed.

Therefore, the consultations on the recommendation for tracking system are designed in two stages:

- The current (second) round of consultations addresses general options for the design of tracking systems, and the results will have an interim status within the project. They will give important guidance for the further analysis within the project, but do not yet represent a final recommendation.
- The third round of consultations, which is scheduled for October 2006, will resume and conclude the discussion in the light of the cost/benefit analysis and the technical implications of the tracking system design. After this round, the final recommendation will be fixed.

This document has been prepared in order to support the discussions with stakeholders. The relevant contents of the document will be presented by members of the project team during the meetings. Participating stakeholders are invited to present their views during the workshops. It is also possible to comment in writing soon after the meetings.

The scenario approach

In order to allow for a structured discussion on the complex issues at stake, the project team has chosen a scenario approach to describe the possible overall design of tracking systems. Under this approach, the individual features of a tracking system are described by so-called “descriptors”, which can take on different states.

Example:

One of the descriptors is called: “Use of explicit tracking for electricity from renewable energy sources (RES-E) and from high-efficiency cogeneration (HE-CHP)”¹

¹ Note that explicit tracking means tracking of electricity attributes using certificates or contract-based methods, as opposed to implicit tracking, which is based on default data, e.g. statistical averages.

This descriptor can take on one of the following states:

- A. Explicit tracking is mandatory for RES-E and HE-CHP
- B. Explicit tracking is mandatory for part of RES-E and CHP (e.g. if RES-E or CHP are used for disclosure or if they are supported)
- C. Explicit tracking of RES-E and HE-CHP is voluntary
- D. Explicit tracking of RES-E and HE-CHP is not possible

In total, the project team has determined more than 40 descriptors which can take on between one and five different states. However, the most important aspects of a specific tracking approach can be described by around ten descriptors.

Any specific tracking system design can be described as a combination of appropriate states of the descriptors, see the following illustration.

Descriptor 1	State A	State B	State C	
Descriptor 2	State A	State B	State C	State D
Descriptor 3	State A	State B		
Descriptor 4	State A	State B	State C	State D

A matrix template for this scenario approach and illustration of the individual options for the system design are included in an annex to this document.

However, in order to give a better picture of the options under discussion, this document focuses on textual descriptions of the different options, which are contained in sections 3 and 4. Section 3 presents three options for the design of tracking systems, which the project team has selected from a larger list of scenarios. They are partly linked to existing implementations in European countries and the selection of the three options is meant to show the relevant range of options under discussion.

The options can be compared and evaluated based on a set of criteria, which are laid out in section 2 of this document. The project team also seeks comments from stakeholders to these criteria and their description. In most cases, there is a trade off between different criteria when designing a concrete tracking system.

Based on the three options described in section 3 and their evaluation, section 4 outlines a first draft for a recommended approach for tracking. As stated above, this draft has a preliminary nature and will be revised in the further course of the project. Comments from stakeholders on this draft and concrete proposals for changes or additions are welcome.

2 Evaluation criteria for tracking options

The project team has selected five major criteria for the evaluation of tracking system designs. Most of them actually summarise several individual aspects. For example: While accuracy is a relatively straightforward criteria, the (expected) acceptance by stakeholders is summarised together with other aspects in the criterion "feasibility". For each tracking system design outlined below, a short textual description of the evaluation is given in combination with a graph showing a rough numeric assessment of each option. Here, each option is ranked between 0 and 5 points for each of the five criteria.

In selecting the evaluation criteria, the project team has taken up similar discussions from previous studies on tracking issues, e.g. from the 4C Electricity project and the Consumer Information on Electricity project.

As stated in the previous section, the current stage of the evaluation can not yet address in detail the cost and benefits of the tracking options. This analysis will be added later, and any final conclusions from the analysis will be postponed until then.

Informational value

This criterion describes mainly qualitative aspects of the information that is gained, processed and provided (i.e.: tracked) by the tracking scheme on hand. This might be regarded as the degree of “added value” by the tracking scheme compared to a business-as-usual-scenario. It thus includes an evaluation of different aspects: What do consumers, other market participants, regulators and stakeholders gain from the information provided by the tracking scheme? Can consumers better distinguish between suppliers and their products? Can governments and regulators verify support mechanisms and accounting for RES-E targets in an efficient manner? Is the degree of detail of tracking information provided sufficient for these purposes?

Accuracy

The criterion of accuracy focuses on quantitative aspects of the tracked information. Tracking data should be collected and processed in a correct and objective way, and the results delivered by the tracking system should be free of systematic errors such as multiple counting (which includes multiple issuing, multiple sale and unintended multiple benefit/use) of attributes and the corresponding loss of attribute information. This relates to the degree of precision achieved and the margin of error expected. This criterion does not yet include errors and fraud by the actors involved (which is covered by the criterion “robustness”), it rather addresses the “ideal” functioning of the system.

Robustness

Credibility of the system is also highly depending on its resistance against “distortions” of information due to errors and fraud by the actors involved in the operation of the tracking scheme. In this regard, the aspect of traceability can be used as one indicator for robustness. This means the ability of the system (e.g. within a central registry) for recording and verifying the origin, any activities (e.g. issuing, transfer and redemption) and ownership of electricity attributes. Another aspect of this criterion is the quality of verification procedures by third parties that are foreseen.

Feasibility

Implementation of the system has to be feasible under realistic conditions of markets and framework conditions for the actors involved in the tracking activity. Thus, the tracking system has to accord to some extent to the existing economic, socioeconomic, regulatory and legislative framework. This implies that the tracking scheme should not be too complex and that it should not conflict with market conditions and functioning, and in particular should not endanger the liquidity of electricity markets. Another quite important factor within this criterion is a positive cost/benefit ratio, which should include all direct and indirect cost and benefits of the tracking system. A further aspect might be the possibility for fair participation of all market players and stakeholder groups.

Flexibility

This criterion describes the ability of the system to adapt to different framework conditions both in terms of national or regional frameworks and their changes over time. The criterion of flexibility thus includes the ability to handle limited variations from the European tracking standard, which might be required in order to adapt its implementation to concrete national framework conditions. Furthermore, it should be evaluated to which extent the system will be able to adapt itself over time to lessons learned and to changing requirements.

3 Three alternative tracking options

In the following, three options for the design of electricity tracking systems are outlined. These options have been selected by the project team in order to show the range of relevant options. Obviously, within this range a lot of other combinations of individual aspects of the scheme design (descriptors in the scenario matrix) would be possible. The options below are meant as examples, and have been used together with their evaluation to develop the draft recommendation for the tracking system design in section 4. For each of the options, a corresponding scenario matrix is included in the annex to this document. These might allow a more structured comparison between the options than the textual description.

3.1 Option A: "Ex post contract tracking"

General features of the tracking scheme

Under this option, tracking of electricity is by default based on electricity contracts. However, in order not to compromise the liquidity of electricity markets, the tracking information does not necessarily have to be available to trading parties at the point in time when trades are performed. The standard tracking procedure is rather based on the balances of electricity trading between market participants, which are determined ex post, e.g. after the end of the calendar year. However, explicit tracking options such as electricity contracts with ex ante specification of the attributes (e.g. green power contracts) and certificates can be used in parallel to the ex post procedure.

In order to determine the ex post contract tracking information² after the end of a calendar year, all market participants determine their electricity trading balance with all trading partners over that year. In the first step of an iterative process, those market actors with a high share of own production or direct purchases from generators notify their company generation mix to all those actors, who have in total over that year purchased electricity from them. Based on this information, all market participants can generate a first rough assessment of their attribute portfolio, based on the information from own generation and on the traded electricity volumes and the attributes which the net sellers have provided to their customers. In the next iteration, this first portfolio information is passed on by all net sellers of electricity to their customers. This leads to a refinement of the first assessment of the attribute portfolios of each market participant, because in this iteration, the bilateral trades between market participants, which are not generators, can already be taken into account. Depending on the complexity of the market, it might be necessary to repeat this procedure a few times, based each time on the refined

² The ex post contract tracking system described in this paragraph is closely related to the system recommended by the German utility association VDEW. Other parts of the tracking option A are different from the German recommendation.

information from the preceding iteration. In the end, this procedure results in an approximation of the distribution of attributes, which would have occurred if all net sellers had known the attributes of electricity which they have generated or acquired beforehand and had submitted this company mix information to their customers (which in reality is not possible due to the complexity of the electricity market).

For electricity of unclear, but domestic origin (e.g. from power exchanges) statistical default values are available which are based on national electricity production data and are not corrected by attributes tracked otherwise (no residual mix calculation). For imports, which are not associated with explicit tracking information, a European production mix (such as the UCTE and NORDEL statistics) is applied. If traders export electricity, then they can choose to either submit explicit tracking information or to apply the statistical default value (national production mix). There is no regulation how exporters of electricity have to account for attributes which have been submitted to their customers. Also there are no regulations to guarantee for a (national) balance between physical energy and attributes.

Tracked information

There are not many specific regulations on the information which is conveyed by the tracking scheme. For example, there is no standardised list of energy sources which all market participants would have to use. This could lead to problems and finally to loss of information if participants in the system use incompatible categories. Tracking information must include the period of electricity production, but these periods are not standardised. The environmental indicators required for electricity disclosure are not included in the tracked information, which means that this information must be determined based on average emission factors by fuel type.

The tracking scheme does not include information whether electricity from RES or HE-CHP has received Guarantees of Origin, nor does it report whether a support mechanism has been used.

Supported applications of tracking information

Obviously, the tracking system can be used for disclosure. However, in Option A the use of the scheme described above is not mandatory, i.e. market participants are free in how they determine their disclosure information. Support schemes available for RES-E and HE-CHP can be included in the ex post accounting procedure, if they include an allocation of supported energy to the electricity portfolio of market players (as is the case with e.g. the German feed in system). Guarantees of Origin are not integrated in the tracking scheme. Due to this, the scheme will not be able to convey RES-E target accounting information across national borders.

Reliability and verification measures

If certificates are used for disclosure, then they must be redeemed. This provides some protection against multiple use of attributes. There are no binding requirements for independent verification of the tracking system and its results. However, this can be done by market players on a voluntary basis.

Preliminary evaluation of Option A

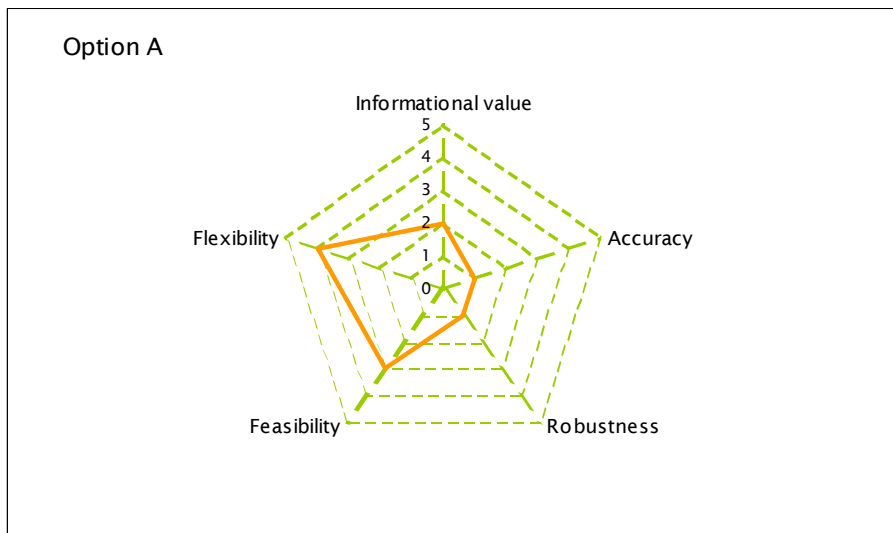
The ex post contract tracking approach used in this option does not clearly fall under either of the typical categories of explicit or implicit tracking. It is not really an explicit tracking mechanism, because the parties of a trade do not know the attributes of any individual transaction when the deal is made. Of

course they can assume last year's values, but this is not certain. It is only after the end of the calendar year, that the attributes will be determined. On the other hand, the ex post scheme is also not a truly implicit mechanism, as the allocation of attributes is not identical to all parties using this procedure. Therefore, this approach must be treated as a third category.

Clearly, the coexistence of several independent options for tracking attributes (ex post procedure, explicit contact tracking, certificates) with statistical default values which are not corrected into a residual mix, opens up several possibilities for multiple counting of attributes and correspondingly the loss of other attribute information. One can imagine that green attributes will be put forward explicitly by suppliers who own or buy them and that at the same time, other suppliers who have less green a mix than average will tend to disclose a mix that will be based fully or mostly on statistical averages, therefore accounting for the green attributes for a second time.

Another danger for multiple counting lies in the lack of integrating Guarantees of Origin in the tracking scheme. This makes it possible that attributes are used within the tracking scheme and a copy of these attributes are used either in the same country or abroad based on a Guarantee of Origin. The effects of this tracking option in terms of informational value and accuracy depends on the share of default values used and of the share of explicit tracking including Guarantees of Origin.

The robustness of the tracking scheme is also limited, because errors and fraud can more easily occur and are more difficult to detect if several parallel tracking systems exist. On the other hand, the system is relatively easy to implement, as no direct implications arise for electricity trading processes. As the cost/benefit analysis of different tracking options is not yet completed, it is not clear yet whether this option, which offers different options for market participants, ranks better or worse in the end. Clearly, the shortfalls of this option in terms of accuracy and informational value will reduce its acceptance by many stakeholders. The flexibility of this option is quite high, as it includes several tracking options, which could be applied as appropriate.



3.2 Option B: “Voluntary certificate system plus residual mix”

General features of the tracking scheme

Similar to option A, explicit tracking of electricity is generally performed on a voluntary basis. However, governments might introduce a cap on the share of each market player's portfolio which is covered by statistical data (implicit tracking). Such a cap is possible because all market participants are able to use certificates for explicit tracking, which can be issued for all kinds of power generation. Therefore tracking information can be acquired even for electricity which is bought from power exchanges or imported.

The certificate system is the only accepted source of information for explicit tracking. Although this system is technically de-linked from electricity contracts, market players are free to bundle contracts for electricity with the (ex post) delivery of certificates. Therefore, market players can use the certificate scheme like a contract-based system if they wish. Due to the specific interests of consumers in RES-E and HE-CHP, these two types of generation may only be disclosed to consumers if they are tracked by using certificates.

The statistical default values for implicit tracking are developed on a regional basis, by determining e.g. one average for the Nordic countries, one for the North-West of continental Europe etc., corresponding to the degree of cross-border integration of regional electricity markets. In each of these regions, the statistical production data is corrected into a residual mix by subtracting all attributes tracked explicitly (based on redeemed certificates).

For imports, which are not associated with explicit tracking information, the importer will apply a regional or national residual mix of the exporting area, or a production mix, whichever is available. If traders export electricity, then they can choose to either submit explicit tracking information or to apply the residual mix. Explicit tracking of exported electricity must be recorded in the certificate registry and a corresponding number of certificates must be exported or redeemed. In order to keep a regional balance between physical energy and attributes, any exports or imports must be associated with transfers of attributes, being either explicit or implicit. Such transfers must be registered with the certificate registry.

Tracked information

The tracking information includes a detailed, standardised list of energy sources for electricity generation, e.g. splitting up fossil fuels into hard coal, lignite, natural gas and oil and other fossil fuels. Based on these standardised energy sources, the tracking information also lists an average emission factor for CO₂ and the specific production of nuclear waste, which can be used for electricity disclosure. In addition to this, certificates record the production period and the issuing date.

Guarantees of Origin for RES-E and HE-CHP are fully integrated into the certificate system, and the tracking system includes a scheme for international accounting for national RES-E targets. In case that support for RES-E or CHP has been used, this fact is recorded on the certificate in the form of an earmark. Based on agreements with generators, additional information on qualification for quality labels, e.g. for green power, can be included on the certificates.

Supported applications of tracking information

Similar to Option A, the use of the tracking system for electricity disclosure is not mandatory, i.e. market participants can also use other sources of information to determine their disclosure information. However, any claims for RES-E and CHP in the disclosure information must be supported by certificates. The support systems for RES-E and HE-CHP are not linked to the tracking scheme, i.e. the allocation of additional cost from the support is not linked to the purchase of supported energy, but could rather be implemented e.g. by a separate system of "support certificates" or on a pro-rata basis for all consumers of electricity.

The certificates issued as Guarantees of Origin for RES-E can be used to convey RES-E target accounting information across national borders.

Reliability and verification measures

Where certificates are used for disclosure, their redemption is mandatory. In combination with the regulations on the residual mix, this ensures that within the tracking system, multiple counting of attributes is prevented. In addition to this, the regulator performs a selective verification of tracking results on a random basis.

Preliminary evaluation of Option B

This tracking option provides a balance between a certain degree of reliability on one side and openness to voluntary systems on the other side. Due to the fact that a residual mix is provided, which reduces the risk of multiple counting, the degree of accuracy of tracking results does not depend on the market share of implicit tracking. The reason why governments might want to restrict the share of implicit tracking is the more meaningful information, which is achieved by explicit tracking.

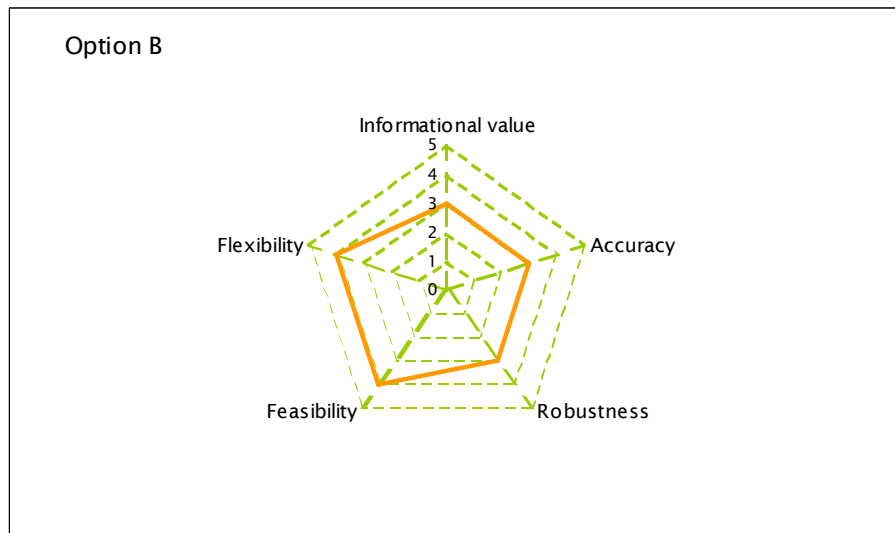
The discriminating value of the information conveyed for green electricity and CHP is high due to the obligation to use certificates for these energy sources. For conventional energy the informational value of this approach depends strongly on the share of implicit tracking used by suppliers. The possibility for governments or regulators to set a cap for this share can ensure a certain level of meaningful information, depending on its level.

In terms of robustness, some uncertainty lies in the fact that support systems for RES-E and HE-CHP are not linked to the tracking scheme. For example, the allocation of cost for supporting RES-E and HE-CHP to consumers on a pro-rata basis or by using separate "support certificates" could be mistaken (or misused) as information which is valid for disclosure purposes. This possible flaw could be made up for by setting up one central registry for tracking both disclosure information and allocation of support cost. This would enable to follow the use that is made of the different accounting units of a single unit of electricity.

Option B performs relatively well on feasibility and flexibility, because certificate based tracking for disclosure is mandatory only for those products which confer an advantage to the stakeholders that own them (green electricity and CHP) and as explicit tracking of conventional electricity is voluntary only (but may be supported by a cap on implicit tracking). This combination could also increase the acceptance of the system among energy industry stakeholders. The flexibility in this option enables motivated actors to commit themselves more than what is legally required as a minimum. Option B

could also be a good starting point for a tracking system which evolves over time, including improved harmonisation on the European level.

A significant distortion in terms of accuracy and informational value can occur because in this option, the tracking system as described above (certificates plus residual mix) is not the exclusive source of information for disclosure. As suppliers are free to use other tools for accounting for their disclosure portfolios (e.g. certified contracts), it is not possible to evaluate the overall reliability and informational value of disclosure information. Certainly, the coexistence of several parallel tracking systems opens up possibilities for multiple counting of attributes. The evaluation of this option would improve significantly, if the use of the tracking system would be mandatory.



3.3 Option C: "Ambitious certificate system"

General features of the tracking scheme

This option is a comprehensive certificate system, which is accompanied by default statistical values for limited purposes only. Tracking of attributes based on certificates is mandatory for all types of generation and therefore certificates are issued automatically for all generation in the region covered by the tracking scheme. Accordingly, redemption of certificates is mandatory for disclosure purposes.

Guarantees of Origin for RES-E and HE-CHP are fully integrated in the tracking scheme. Different to the other options, in this case the certificates are managed in a central European database. This avoids the operation of interfaces between all national registries (and also the alternative, bilateral interfaces from all registries to a central hub). However, a central registry might also reduce the ability of the certificate system to adapt to national framework conditions.

After the end of a calendar year, there is a period for collecting meter data, issuing and transferring certificates, and certificate redemption. The disclosure obligation of suppliers is usually fulfilled by redeeming a sufficient number of certificates until a deadline. The disclosure data for the company portfolio can then be taken directly from the redemption statement issued by the registry. However, there are always cases where the standard procedure does not work, e.g. taking into account line losses and balancing power. Therefore, after the deadline for redemption of certificates which relate to a certain year, a limited number of certificates from that year might still remain in the registry. These

will then be collected and their attributes will form an international residual mix. Different to Options A and B, in Option C the residual mix is meant to cover only a very small share of the market, e.g. where suppliers failed to acquire a sufficient number of certificates.

For undisclosed imports, explicit tracking information is required as a standard. Similarly, exports must be associated with information from a corresponding number of certificates. In cases of imports where no explicit tracking information is available, the regional or national residual mix of the exporting area will be used, or a production mix, whichever is available. However, this solution is only accepted in exceptional cases.

Due to the international character of the registry and the residual mix, it is not necessary to worry for national balancing of electricity and attributes. However, in order to maintain this balance, exports and imports require explicit information (or in exceptional cases, attributes from the residual mix of the exporting region).

Tracked information

The tracking system provides all information required for disclosure purposes. This includes the energy sources for electricity generation, based on a standardised list of energy sources for electricity generation, which differentiates between fossil fuels (e.g. as hard coal, lignite, natural gas and oil and other fossil fuels). Both for CO₂ emissions and for nuclear waste production the system is able to track plant-specific production factors. This allows for example to individually reflect the efficiency of fossil plants, which has an impact on the specific emission.

The certificates include a detailed list of support used for the generation of the underlying electricity. Due to the integration of GO, the system can convey target accounting information across national borders for RES-E and also for HE-CHP (after targets for this technology have been agreed). Although the registry operates on an international level, it is still able to allocate the redemption of each certificate to the individual countries covered, and therefore the verification of progress towards the targets can be based fully on the redemption of qualified certificates.

Other standard certificate information includes the issuing date and the production period. In addition to this, the system can also handle specific information for quality labels, e.g. for green power, on the request of generators.

Supported applications of tracking information

As stated above, the use of the tracking system is mandatory for purposes of electricity disclosure. Support schemes for RES-E and CHP can be facilitated by the tracking system, if the design of the support schemes allow for an allocation of cost of the support scheme and of supported electricity to consumers. The system also facilitates monitoring of targets for RES-E and potentially HE-CHP.

If required, the certificate system can be split up in several systems, each of which supports one of the uses disclosure, support and target accounting (so-called "multi-certificate"-system..

Reliability and verification measures

The redemption of certificates is mandatory for all applications of tracking information. This reduces the danger of multiple counting of attributes and supports the reliability of tracking results. In addition, independent verification of tracking results is required for all market participants.

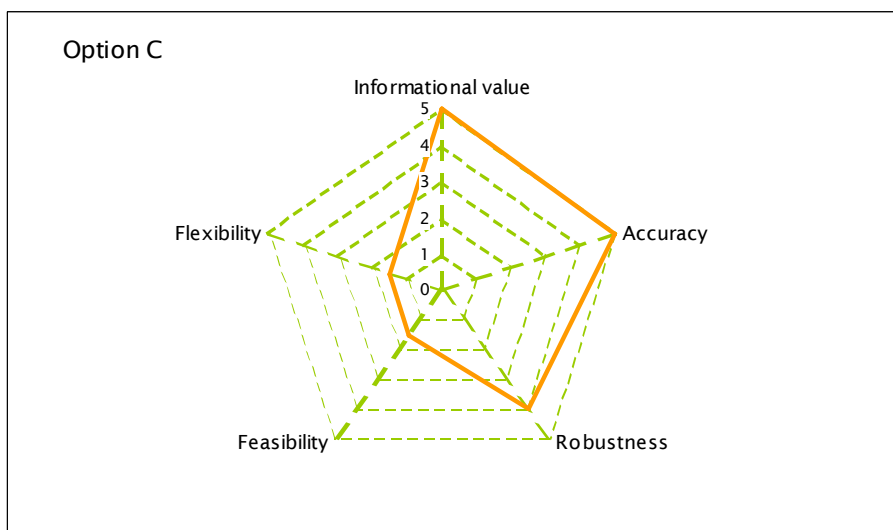
Preliminary evaluation of Option C

The informational value of the tracking result is very high, because the use of statistical averages is minimised. This option maximises the possibilities of suppliers to develop their specific portfolio profile, and of consumers to base their decisions to purchase electricity on their own preferences with regard to energy sources, emissions and price. The system will be used for monitoring of target and facilitating support, hence governments and the European Commission can also make use of tracking information. With a combination of a large share of explicit tracking and a residual mix, determined from unused certificates, wrong counting of attributes can effectively be prevented and the accuracy of this option is very high.

Generally, a comprehensive certificate system with a single registry can provide very good protection against errors and fraud. However, the possibility to separate disclosure certificates from other certificates which are used for purposes of support and target accounting, might incur a danger for misuse of certificates. This slightly reduces the grade in terms of robustness.

On the other hand, the feasibility of this rather strict tracking option is only moderate. Although end consumers and national authorities might appreciate the informational value and accuracy of the scheme, many market participants will see it as a very strict regulation which forces them to use certificates even in cases when there is no market value in them. Subject to further analysis, it can be assumed that this strict regulation does not have the best cost/benefit ratio. However, once it is proven and realised by market players that certificates are an easy to use and reliable tracking instrument, which does not interfere with electricity markets, more stakeholders might be ready to accept an ambitious certificate scheme.

With regards to flexibility, Option C also ranks only moderate. This is because the system is quite advanced and forces all participating countries to make a big step into a comprehensive certificate system. One of the key advantages of this option is that there are no other mechanisms for tracking, whose coexistence with the certificate system could undermine the accuracy of the tracking results. In turn, this feature makes the tracking scheme quite inflexible. On the other hand, the option to unbundle support and target attributes from the disclosure certificate increases the flexibility of the system.



4 Draft recommendation for a harmonised tracking system

Based on the discussion of three selected tracking approaches in the previous section, this section will now outline a first draft of a recommendation for a harmonised tracking system for electricity in Europe. This draft is not identical with one of the scenarios, it rather combines elements of several scenarios.

General features of the tracking scheme

The proposed tracking scheme offers two tracking options to suppliers, explicit tracking based on certificates and a residual mix. The use of the certificate system by market actors is optional, alternatively they can choose to rely on the residual mix. However, if suppliers want to offer green products or any other differentiation of products based on the attributes of electricity generation, then they may only do this by using certificates. In turn this means that the residual mix may only be used for “standard” products of a supplier, which do not make any ex ante claims on the attributes of electricity generation.

The residual mix is determined from statistical data on power generation. Attributes tracked explicitly can be determined from the certificates which have been redeemed. After the end of a calendar year, market players have a certain period of time for issuing, transferring and redeeming certificates relating to production in that year. At the end of this period, all certificates which originate from electricity produced in the respective year and which have not been redeemed are frozen in the user accounts in the registry and are collected from the accounts.

The residual mix is determined on a European level, i.e. covering all countries which have implemented this tracking system or have established compatible systems. This feature of the tracking system assumes a more advanced integration of the Internal Market for electricity as it is the case today. Therefore, until this integration is achieved, the residual might be calculated on a national basis as well. In order to reflect the specific national or regional framework conditions, there can be several registries in different domains across Europe, which work in close cooperation. However, in order to reduce the complexity of the system, there can only be one registry per geographic domain.

The fact that the certificate system is the only accepted way for explicit tracking reduces complexity and dangers of multiple counting, and makes verification of tracking results easier. Market players can choose to link transactions in certificates to electricity contracts if they wish. In this case, a contract for delivery of electricity would be bundled with another contract about the delivery of certificates, which due to technical reasons can only be issued after generation and consumption have taken place.

The Guarantees of Origin for RES-E and HE-CHP are fully integrated in the certificate system.

Imports from countries with no compatible tracking systems should preferably be associated with explicit tracking information. If such information is not available, then a regional or national residual mix of the exporting region should be used, or production mix (whichever is available). Similarly for exports, traders can choose either to submit explicit tracking information or to use data from the residual mix. In order to maintain a balance between electricity and attributes, all exports and imports have to be associated with attributes. Similarly, the import of certificates from countries which are not participating in the tracking system without a corresponding import of electricity is only possible if an equivalent volume of attributes is returned into these countries (“swap” in attributes). Further restrictions on these kind of transactions might be imposed by governments.

Tracked information

The tracking system features a standardised list of energy sources for electricity generation, which differentiates between fossil fuels (e.g. as hard coal, lignite, natural gas and oil and other fossil fuels). Plant-specific production factors for CO₂ emissions and for nuclear waste production are optional. If generators do not provide such specific information, then average emission factors will be inserted in the certificate information.

The certificates also state their issuing date and the production period, which is standardised in calendar months. This supports the automated generation of the residual mix by the registries. On the request of generators, specific information for quality labels, e.g. for green power, can be included in the certificates.

Support which has been granted for electricity production is recorded on the certificates in the form of earmarks. Due to the integration of GO, the system can convey target accounting information across national borders for RES-E. If similar targets for HE-CHP have been agreed between governments, then these could be verified as well through the certificate system.

Supported applications of tracking information

The use of the tracking system is mandatory for purposes of electricity disclosure, i.e. no other source of information may be used. This regulation improves the reliability of the tracking information and simplifies verification. Support schemes for RES-E and CHP will usually be implemented separately from the tracking system, unless the allocation of cost of the support scheme is based on the allocation of the supported electricity to consumers. In the latter case it is possible to link support schemes to the tracking mechanism. In any case, the tracking system is compatible with both feed-in and quota obligation support schemes and does not predetermine the design of the support schemes.

As stated above, the system facilitates monitoring of targets for RES-E and potentially HE-CHP.

Reliability and verification measures

Redemption of certificates is mandatory for all applications of tracking information. This reduces the danger of multiple counting of attributes and supports the reliability of tracking results. In addition to this, the regulator performs a selective verification of tracking results on a random basis.

Preliminary evaluation of the draft recommendation

The informational value of this tracking option is high for all products which are differentiated by specific claims of suppliers, because for these products the certificate system must be used. For standard products, which are not specified in terms of their generation attributes, the informational value can be low, because suppliers can fully rely on a residual mix for these products.

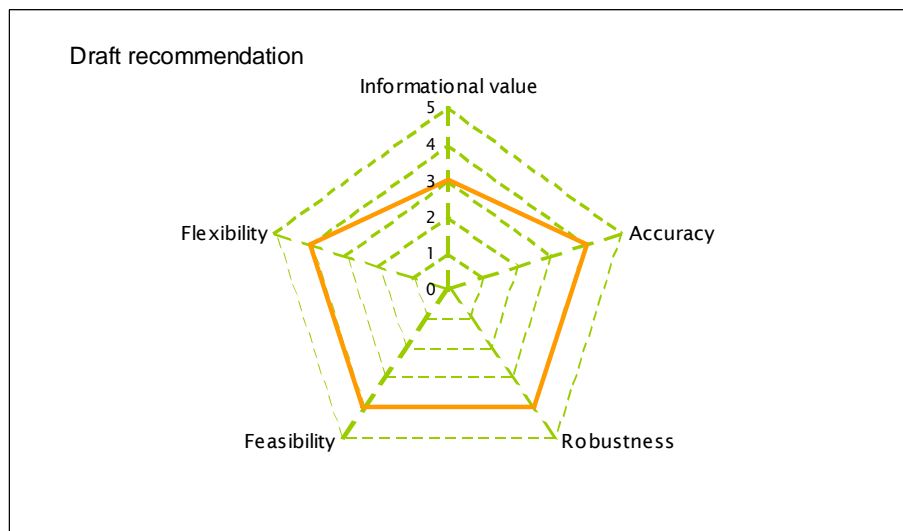
This differentiation might be justified by the different interest which consumers might have in their products. However, it should be discussed how the informational value of this tracking option can be increased for all products.

Due to the combination of a certificate system with a residual mix, the accuracy of this approach is high. The strict rules for handling attributes for imports and exports also support the accuracy of tracking results. For the same reasons, the robustness of this draft recommendation ranks quite good. The

registries have a high capability to trace attributes “from cradle to grave”, which makes it easier to detect errors and fraud.

Market players are not required to actively use the certificate system, which should increase the acceptance of this approach. For other stakeholders, the high accuracy of the scheme can be a strong argument to support this approach. Overall, the feasibility is ranked good.

The flexibility of the draft recommendation is also good, because the combination of certificates with a residual mix gives market players and governmental bodies a range of options how to use the tracking scheme. For example, it would be possible to reduce the requirement to capture generation data from all plants, e.g. by requiring information only from large plants during an inception phase of the tracking scheme. Similarly, if governments or regulators want to increase the informational value of the scheme, it would be possible to restrict the use of the residual mix (as it was proposed in Option B).



5 Main cost drivers for tracking options

The objective of work package 5 of the E-TRACK project is to carry out a detailed cost assessment for a proposed standard of an European tracking system, which is developed in parallel in other work packages. As a comparison, the relevant benefits of such a system will be assessed as well. However, this assessment will mostly have to rely on qualitative judgements, because it is difficult to express the benefits in quantitative terms.

The analysis will take into account experiences of operators which already operate a tracking system or comparable systems. It will be based on desktop research and discussions with various parties potentially involved in the implementation and operation of tracking systems. The costs that are associated with the implementation and operation of existing tracking system will be raised by the involved and concerned parties. In addition, recommendations on the distribution of costs among the actors involved are developed. This will take into account where the costs actually incur and who receives the benefits, aiming at a balanced cost sharing model.

As a first step of the cost assessment, the main cost drivers have been identified, and comments from stakeholders on this list are invited.

Cost drivers for system development and implementation

- setting up organisational structures
- composing detailed system specifications
- software development / development of a registry
- collection of initial data input
- testing of registry
- organisation of data input
- development of interfaces between registries
- composing information material for users
- training of market actors

Cost drivers for system operation and adaptation

- governance of the overall system
- operation and maintenance of the system (keep the system running and up to date)
 - hardware maintenance
 - software maintenance
 - data handling
- user support
- further development of the system due to user needs and policy development

Cost drivers for system operation – issuing aspects

- certification and auditing of plants
- collection of plant master data
- collection of generation data
- verification of input data

Cost drivers for system operation – transfer aspects

- handling of information (certificate) transfer

Cost drivers for system operation – usage and redemption aspects

- conversion of data into format for final use (e.g. for disclosure)
- verification of output data
- calculation of residual mix (if appropriate)

Based on the list of cost drivers a questionnaire was developed and sent out to organisations which have experience and work with existing tracking systems. This will be the main source for inputs for the cost assessment. The data collected through the questionnaire are currently being analysed.

When the proposed European tracking scheme is developed in more detail, a second questionnaire addressing the national stakeholders will be used in order to improve and refine the cost assessment.

Most of the work of work package 5 is scheduled for the next months. Draft deliverables for work package 5 will be produced by July/August 2006 and will be subject to the third round of consultation in October 2006.

6 Next steps in the E-TRACK project

This document will be used for the discussions in the second round of consultation workshops and in the third meeting of the Advisory Group. The results from these events will be taken up in the further work of the project, which include

- a further development of the overall (non-technical) specifications of the proposed tracking scheme,
- technical specifications of the registries and interfaces required and of the processes to handle data in the tracking system, and
- a detailed analysis of the cost and benefits of tracking approaches and the draft recommendation.

Based on the results from this work, a revised draft recommendation for a European tracking system will be developed. This draft and the underlying results from the individual work packages will be discussed in a third round of consultations and in a further meeting of the Advisory Group. Based on the feedback received in these events, the project team will finalise the recommendation from the project.

Annex

- Scenario matrix - Template
- Scenario matrix – Option A
- Scenario matrix – Option B
- Scenario matrix – Option C
- Scenario matrix – Draft recommendation

E-TRACK Scenarios			Scenario:	(Template)				
List of Descriptors								
No.	Descriptor		comment	State A	State B	State C	State D	State E
A. General features of tracking scheme								
A.1	Explicit tracking for non-RES-E / non-HE-CHP generation?			Mandatory for all transactions	Mandatory, except undisclosed imports and purchases from power exchanges	Mandatory for long term contracts	Voluntary	Not possible
A.2	Explicit tracking for RES-E and HE-CHP generation?		<i>E.g. via GOs</i>	Mandatory for RES-E and HE-CHP	Mandatory for part of RES-E and CHP	Voluntary	Not possible	
A.3	Use of standardised accounting units for explicit tracking		<i>E.g. certificates, tags</i>	Mandatory	Optional	Never		
A.3.1	Limited lifetime of accounting units			Acc.units can be used only for the calendar year of issuing	Acc.units can be used longer than the calendar year of issuing	Unlimited	Technically unlimited, but limited by regulations of tracking uses	
A.4	Explicit tracking can be de-linked from electricity contracts?			Yes, standard	Optional	Not possible		
A.4.1	(Standard) Explicit tracking mechanism linked to balances of electricity trading?		<i>Ex post contract tracking, e.g. as in Germany</i>	Yes	Optional	No		
A.5	Physical connection required for participation in tracking?		<i>Relates to off-grid supply and exchanges of attributes from overseas</i>	Yes	No			
A.6	Use of registries for explicit tracking			Mandatory for all explicit tracking	Optional	No registry available		
A.6.1	Type of registries			Unique European registry	Unique registry per country or domain	Several parallel registries	No registry	
A.7	Use of statistical averages (implicit tracking)		<i>(Note)</i>	No default value available	Limited to certain volumes/transactions	Unlimited		
A.7.1	Limitation of total share of statistical averages within portfolio?			Unlimited	Limited to a certain share			
A.7.2	Limitation of use of statistical averages for certain transactions?			Unlimited	Limitation for certain transactions			
A.7.3	Type of statistical average used			European (more than UCTE)	Transmission system, e.g. UCTE	Region (several countries)	National	Sub-national
A.7.4	Correction by attributes tracked explicitly		<i>Corrections result in a residual mix</i>	Unused certificates are collected for the residual mix and redeemed	Other forms of correction by <u>all</u> attributes being tracked explicitly	Other forms of correction by <u>part of</u> the attributes being tracked explicitly	No correction	
A.8	Handling of specific "low-information" processes		<i>Rating according to descriptors A.8.1 to A.8.5</i>	Ambitious approach	Moderate approach	Less ambitious approach		
A.8.1	Handling of imports without explicit tracking		<i>(note)</i>	use regional or national residual or production mix	Use national residual mix if available	Use European production mix	Use national production mix	Treat as "unknown origin"

E-TRACK Scenarios			Scenario:	(Template)				
List of Descriptors								
No.	Descriptor		comment	State A	State B	State C	State D	State E
A.8.2	Handling of exports		<i>(note)</i>	Exports must be associated with explicit tracking information	Explicit tracking optional, otherwise use standard implicit tracking information	Use standard implicit tracking information	Default value different to the standard implicit tracking information	No regulation
A.8.2.1	Accounting of exported attributes			Exported attributes are recorded and must be deducted from exporter's attribute account	Exports of attributes are not accounted for	No regulation		
A.8.3	Handling of power exchange transactions without explicit tracking		<i>Power exchange could also set up e.g. a hydro exchange</i>	Use certificates	Use internal "exchange mix"	Use statistical average used for implicit tracking	Treat as "unknown origin"	
A.8.4	Handling of system losses			Default reduction factor for explicit tracking	Covered by implicit tracking (default)	Ignored		
A.8.5	Handling of balancing power			Use certificates	Linked to statistical average used for implicit tracking	Ignored		
A.9	Measures for regional balancing of physical energy and attributes			Joint residual mix for all participating countries	Ex/Imports must be balanced (either attributes plus power or swap in attributes)	none		
B. Tracked information								
B.1	Qualification as GO		<i>Do accounting units specify whether they qualify as GO?</i>	RES and CHP	Only RES	Only CHP	No information	
B.2	Production period			Mandatory, standardised production periods	Mandatory, no standardised production periods	Optional	No information	
B.3	Issuing date of accounting unit			Mandatory	Optional	No information		
B.4	Energy sources			Detailed list of standard sources (coal, gas, nuclear etc.)	Standard clusters (e.g. nuclear, renewables, fossil&other)	No standardisation		
B.5	Qualification for high-efficiency CHP			Mandatory	Optional	No		
B.5.1	Basis for qualification of HE CHP			Based on CHP Directive	Other criteria	Not applicable		
B.6	Support			Support log, listing all relevant support	Earmark (y/n) for "major" support	No support information		
B.7	RES-E/HE-CHP target		<i>On EU level only relevant for RES-E</i>	RES and CHP	Only RES	Only CHP	No information	
B.8	Environmental indicators							

E-TRACK Scenarios			Scenario:	(Template)				
List of Descriptors								
No.	Descriptor		comment	State A	State B	State C	State D	State E
B.8.1	CO2 emissions		<i>GHG (CO2 equivalents) neglected here</i>	Plant-specific emissions recorded	Plant-specific combination of high/low emission attributes	Emissions of plant type	No CO2 information	
B.8.2	Nuclear waste			Plant-specific waste production recorded	Plant-specific combination of high/low waste production attributes	Waste production of plant type	No nuclear waste information	
B.8.3	Other		<i>SOx, NOx, dust etc.</i>	Additional envir. Indicators included	No inclusion of add. envir. indicators			
B.8.4	Basis of environmental indicators			Full upstream process chain analysis	Standardised factors for impact of upstream process chain	Only direct emissions, no process chain analysis		
B.9	Specific information for quality labels		<i>E.g. EUGENE eligibility and additionality info</i>	Mandatory, standardised	Optional, standardised	Optional, not standardised	No	
C. Uses of tracking								
C.1	Tracking system used for disclosure			Mandatory	Optional	No		
C.2	Tracking system used for green power market			Mandatory	Optional	No		
C.3	Tracking system and support schemes		<i>For RES-E, CHP etc.</i>					
C.3.1	Facilitation of support scheme			Support facilitated through tracking scheme	Support facilitated by a separate tracking scheme	No tracking for support		
C.3.2	Transparency about support		<i>Linked to B.6</i>	Support recorded in tracked information	No provision of support information			
C.4	Tracking system and target accounting		<i>Linked to B.7</i>	Verification of target fully based on tracking system	Tracking of target eligibility for exports and imports	No tracking of target information		
C.5	Accounting units used for several purposes?		<i>This relates to the "multi-certificate" discussion</i>	Separate accounting units for disclosure, support and target	Constraints apply to accounting units for disclosure, support and target	Single accounting unit for disclosure, support and target	Disclosure is only purpose of tracking	
D. Reliability and verification measures								
D.1	Independent verification of tracking results			Mandatory for all participants	Selective verification by the regulator	Verification on voluntary basis only		
D.2	Redemption of accounting units			Mandatory for all uses	Mandatory for disclosure only	No requirements		

E-TRACK Scenarios		Scenario:	Option A	"Ex post contract tracking"				
List of Descriptors			27.04.2006					
No.	Descriptor	comment	State A	State B	State C	State D	State E	Explanations
A. General features of tracking scheme								
A.1	Explicit tracking for non-RES-E / non-HE-CHP generation?		Mandatory for all transactions	Mandatory, except undisclosed imports and purchases from power exchanges	Mandatory for long term contracts	Voluntary	Not possible	
A.2	Explicit tracking for RES-E and HE-CHP generation?	<i>E.g. via GOs</i>	Mandatory for RES-E and HE-CHP	Mandatory for part of RES-E and CHP	Voluntary	Not possible		
A.3	Use of standardised accounting units for explicit tracking	<i>E.g. certificates, tags</i>	Mandatory	Optional	Never			
A.3.1	Limited lifetime of accounting units		Acc.units can be used only for the calendar year of issuing	Acc.units can be used longer than the calendar year of issuing	Unlimited	Technically unlimited, but limited by regulations of tracking uses		
A.4	Explicit tracking can be de-linked from electricity contracts?		Yes, standard	Optional	Not possible			
A.4.1	(Standard) Explicit tracking mechanism linked to balances of electricity trading?	<i>Ex post contract tracking, e.g. as in Germany</i>	Yes	Optional	No			
A.6	Use of registries for explicit tracking		Mandatory for all explicit tracking	Optional	No registry available			
A.6.1	Type of registries		Unique European registry	Unique registry per country or domain	Several parallel registries	No registry		
A.7	Use of statistical averages (implicit tracking)	<i>(Note)</i>	No default value available	Limited to certain volumes/transactions	Unlimited			
A.7.1	Limitation of total share of statistical averages within portfolio?		Unlimited	Limited to a certain share				
A.7.2	Limitation of use of statistical averages for certain transactions?		Unlimited	Limitation for certain transactions				
A.7.3	Type of statistical average used		European (more than UCTE)	Transmission system, e.g. UCTE	Region (several countries)	National	Sub-national	
A.7.4	Correction by attributes tracked explicitly	<i>Corrections result in a residual mix</i>	Unused certificates are collected for the residual mix and redeemed	Other forms of correction by all attributes being tracked explicitly	Other forms of correction by part of the attributes being tracked explicitly	No correction		
A.8	Handling of specific "low-information" processes	<i>Rating according to descriptors A.8.1 to A.8.5</i>	Ambitious approach	Moderate approach	Less ambitious approach			
A.8.1	Handling of imports without explicit tracking	<i>(note)</i>	use regional or national residual or production mix	Use national residual mix if available	Use European production mix	Use national production mix	Treat as "unknown origin"	
A.8.2	Handling of exports	<i>(note)</i>	Exports must be associated with explicit tracking information	Explicit tracking optional, otherwise use standard implicit tracking information	Use standard implicit tracking information	Default value different to the standard implicit tracking information	No regulation	

E-TRACK Scenarios				Scenario:	Option A	"Ex post contract tracking"				
List of Descriptors					27.04.2006					
No.	Descriptor			comment	State A	State B	State C	State D	State E	Explanations
A.8.2.1		Accounting of exported attributes			Exported attributes are recorded and must be deducted from exporter's attribute account	Exports of attributes are not accounted for	No regulation			
A.8.3		Handling of power exchange transactions without explicit tracking			<i>Power exchange could also set up e.g. a hydro exchange</i>	Use certificates	Use internal "exchange mix"	Use statistical average used for implicit tracking	Treat as "unknown origin"	
A.9		Measures for regional balancing of physical energy and attributes				Joint residual mix for all participating countries	Ex/Imports must be balanced (either attributes plus power or swap in attributes)	none		
B. Tracked information										
B.1		Qualification as GO			<i>Do accounting units specify whether they qualify as GO?</i>	RES and CHP	Only RES	Only CHP	No information	
B.2		Production period				Mandatory, standardised production periods	Mandatory, no standardised production periods	Optional	No information	
B.3		Issuing date of accounting unit				Mandatory	Optional	No information		
B.4		Energy sources				Detailed list of standard sources (coal, gas, nuclear etc.)	Standard clusters (e.g. nuclear, renewables, fossil&other)	No standardisation		
B.5		Qualification for high-efficiency CHP				Mandatory	Optional	No		
B.5.1		Basis for qualification of HE CHP				Based on CHP Directive	Other criteria	Not applicable		
B.6		Support				Support log, listing all relevant support	Earmark (y/n) for "major" support	No support information		
B.7		RES-E/HE-CHP target			<i>On EU level only relevant for RES-E</i>	RES and CHP	Only RES	Only CHP	No information	
B.8		Environmental indicators								
B.8.1		CO2 emissions			<i>GHG (CO2 equivalents) neglected here</i>	Plant-specific emissions recorded	Plant-specific combination of high/low emission attributes	Emissions of plant type	No CO2 information	
B.8.2		Nuclear waste				Plant-specific waste production recorded	Plant-specific combination of high/low waste production attributes	Waste production of plant type	No nuclear waste information	
B.8.3		Other			<i>SOx, NOx, dust etc.</i>	Additional envir. Indicators included	No inclusion of add. envir. indicators			

E-TRACK Scenarios		Scenario:	Option A	"Ex post contract tracking"				
List of Descriptors			27.04.2006					
No.	Descriptor	comment	State A	State B	State C	State D	State E	Explanations
B.8.4	Basis of environmental indicators		Full upstream process chain analysis	Standardised factors for impact of upstream process chain	Only direct emissions, no process chain analysis			
B.9	Specific information for quality labels	<i>E.g. EUGENE eligibility and additionality info</i>	Mandatory, standardised	Optional, standardised	Optional, not standardised	No		
C. Uses of tracking								
C.1	Tracking system used for disclosure		Mandatory	Optional	No			
C.2	Tracking system used for green power market		Mandatory	Optional	No			
C.3	Tracking system and support schemes	<i>For RES-E, CHP etc.</i>						
C.3.1	Facilitation of support scheme		Support facilitated through tracking scheme	Support facilitated by a separate tracking scheme	No tracking for support			
C.3.2	Transparency about support	<i>Linked to B.6</i>	Support recorded in tracked information	No provision of support information				
C.4	Tracking system and target accounting	<i>Linked to B.7</i>	Verification of target fully based on tracking system	Tracking of target eligibility for exports and imports	No tracking of target information			
C.5	Accounting units used for several purposes?	<i>This relates to the "multi-certificate" discussion</i>	Separate accounting units for disclosure, support and target	Constraints apply to accounting units for disclosure, support and target	Single accounting unit for disclosure, support and target	Disclosure is only purpose of tracking		
D. Reliability and verification measures								
D.1	Independent verification of tracking results		Mandatory for all participants	Selective verification by the regulator	Verification on voluntary basis only			
D.2	Redemption of accounting units		Mandatory for all uses	Mandatory for disclosure only	No requirements			

E-TRACK Scenarios		Scenario:	Option B	"Voluntary certificate system"				
List of Descriptors			26.04.2006					
No.	Descriptor	comment	State A	State B	State C	State D	State E	Explanations
A. General features of tracking scheme								
A.1	Explicit tracking for non-RES-E / non-HE-CHP generation?		Mandatory for all transactions	Mandatory, except undisclosed imports and purchases from power exchanges	Mandatory for long term contracts	Voluntary	Not possible	
A.2	Explicit tracking for RES-E and HE-CHP generation?	<i>E.g. via GOs</i>	Mandatory for RES-E and HE-CHP	Mandatory for part of RES-E and CHP	Voluntary	Not possible		
A.3	Use of standardised accounting units for explicit tracking	<i>E.g. certificates, tags</i>	Mandatory	Optional	Never			
A.3.1	Limited lifetime of accounting units		Acc.units can be used only for the calendar year of issuing	Acc.units can be used longer than the calendar year of issuing	Unlimited	Technically unlimited, but limited by regulations of tracking uses		
A.4	Explicit tracking can be de-linked from electricity contracts?		Yes, standard	Optional	Not possible			
A.4.1	(Standard) Explicit tracking mechanism linked to balances of electricity trading?	<i>Ex post contract tracking, e.g. as in Germany</i>	Yes	Optional	No			
A.6	Use of registries for explicit tracking		Mandatory for all explicit tracking	Optional	No registry available			
A.6.1	Type of registries		Unique European registry	Unique registry per country or domain	Several parallel registries	No registry		
A.7	Use of statistical averages (implicit tracking)	<i>(Note)</i>	No default value available	Limited to certain volumes/transactions	Unlimited			
A.7.1	Limitation of total share of statistical averages within portfolio?		Unlimited	Limited to a certain share				
A.7.2	Limitation of use of statistical averages for certain transactions?		Unlimited	Limitation for certain transactions				
A.7.3	Type of statistical average used		European (more than UCTE)	Transmission system, e.g. UCTE	Region (several countries)	National	Sub-national	
A.7.4	Correction by attributes tracked explicitly	<i>Corrections result in a residual mix</i>	Unused certificates are collected for the residual mix and redeemed	Other forms of correction by all attributes being tracked explicitly	Other forms of correction by part of the attributes being tracked explicitly	No correction		
A.8	Handling of specific "low-information" processes	<i>Rating according to descriptors A.8.1 to A.8.5</i>	Ambitious approach	Moderate approach	Less ambitious approach			
A.8.1	Handling of imports without explicit tracking	<i>(note)</i>	use regional or national residual or production mix	Use national residual mix if available	Use European production mix	Use national production mix	Treat as "unknown origin"	
A.8.2	Handling of exports	<i>(note)</i>	Exports must be associated with explicit tracking information	Explicit tracking optional, otherwise use standard implicit tracking information	Use standard implicit tracking information	Default value different to the standard implicit tracking information	No regulation	

E-TRACK Scenarios				Scenario:	Option B	"Voluntary certificate system"				
List of Descriptors					26.04.2006					
No.	Descriptor			comment	State A	State B	State C	State D	State E	Explanations
A.8.2.1		Accounting of exported attributes				Exported attributes are recorded and must be deducted from exporter's attribute account	Exports of attributes are not accounted for	No regulation		
A.8.3		Handling of power exchange transactions without explicit tracking			Power exchange could also set up e.g. a hydro exchange	Use certificates	Use internal "exchange mix"	Use statistical average used for implicit tracking	Treat as "unknown origin"	As an alternative to certificates, the residual mix might also be accepted (depending on the cap set on implicit tracking)
A.9		Measures for regional balancing of physical energy and attributes				Joint residual mix for all participating countries	Ex/Imports must be balanced (either attributes plus power or swap in attributes)	none		
B. Tracked information										
B.1		Qualification as GO			Do accounting units specify whether they qualify as GO?	RES and CHP	Only RES	Only CHP	No information	
B.2		Production period				Mandatory, standardised production periods	Mandatory, no standardised production periods	Optional	No information	
B.3		Issuing date of accounting unit				Mandatory	Optional	No information		
B.4		Energy sources				Detailed list of standard sources (coal, gas, nuclear etc.)	Standard clusters (e.g. nuclear, renewables, fossil&other)	No standardisation		
B.5		Qualification for high-efficiency CHP				Mandatory	Optional	No		
B.5.1		Basis for qualification of HE CHP				Based on CHP Directive	Other criteria	Not applicable		
B.6		Support				Support log, listing all relevant support	Earmark (y/n) for "major" support	No support information		
B.7		RES-E/HE-CHP target			On EU level only relevant for RES-E	RES and CHP	Only RES	Only CHP	No information	
B.8		Environmental indicators								
B.8.1		CO2 emissions			GHG (CO2 equivalents) neglected here	Plant-specific emissions recorded	Plant-specific combination of high/low emission attributes	Emissions of plant type	No CO2 information	
B.8.2		Nuclear waste				Plant-specific waste production recorded	Plant-specific combination of high/low waste production attributes	Waste production of plant type	No nuclear waste information	
B.8.3		Other			SOx, NOx, dust etc.	Additional envir. Indicators included	No inclusion of add. envir. indicators			

E-TRACK Scenarios		Scenario:	Option B	"Voluntary certificate system"				
List of Descriptors			26.04.2006					
No.	Descriptor	comment	State A	State B	State C	State D	State E	Explanations
B.8.4	Basis of environmental indicators		Full upstream process chain analysis	Standardised factors for impact of upstream process chain	Only direct emissions, no process chain analysis			
B.9	Specific information for quality labels	<i>E.g. EUGENE eligibility and additionality info</i>	Mandatory, standardised	Optional, standardised	Optional, not standardised	No		
C. Uses of tracking								
C.1	Tracking system used for disclosure		Mandatory	Optional	No			
C.2	Tracking system used for green power market		Mandatory	Optional	No			
C.3	Tracking system and support schemes	<i>For RES-E, CHP etc.</i>						
C.3.1	Facilitation of support scheme		Support facilitated through tracking scheme	Support facilitated by a separate tracking scheme	No tracking for support			
C.3.2	Transparency about support	<i>Linked to B.6</i>	Support recorded in tracked information	No provision of support information				
C.4	Tracking system and target accounting	<i>Linked to B.7</i>	Verification of target fully based on tracking system	Tracking of target eligibility for exports and imports	No tracking of target information			
C.5	Accounting units used for several purposes?	<i>This relates to the "multi-certificate" discussion</i>	Separate accounting units for disclosure, support and target	Constraints apply to accounting units for disclosure, support and target	Single accounting unit for disclosure, support and target	Disclosure is only purpose of tracking		Cost of support is allocated separately, but target and disclosure are linked
D. Reliability and verification measures								
D.1	Independent verification of tracking results		Mandatory for all participants	Selective verification by the regulator	Verification on voluntary basis only			
D.2	Redemption of accounting units		Mandatory for all uses	Mandatory for disclosure only	No requirements			

E-TRACK Scenarios		Scenario:	Option C	"Ambitious certificate system plus residual mix"				
List of Descriptors			26.04.2006					
No.	Descriptor	comment	State A	State B	State C	State D	State E	Explanations
A. General features of tracking scheme								
A.1	Explicit tracking for non-RES-E / non-HE-CHP generation?		Mandatory for all transactions	Mandatory, except undisclosed imports and purchases from power exchanges	Mandatory for long term contracts	Voluntary	Not possible	Mandatory except for undisclosed imports
A.2	Explicit tracking for RES-E and HE-CHP generation?	<i>E.g. via GOs</i>	Mandatory for RES-E and HE-CHP	Mandatory for part of RES-E and CHP	Voluntary	Not possible		
A.3	Use of standardised accounting units for explicit tracking	<i>E.g. certificates, tags</i>	Mandatory	Optional	Never			
A.3.1	Limited lifetime of accounting units		Acc.units can be used only for the calendar year of issuing	Acc.units can be used longer than the calendar year of issuing	Unlimited	Technically unlimited, but limited by regulations of tracking uses		This is the basis for creating the residual mix
A.4	Explicit tracking can be de-linked from electricity contracts?		Yes, standard	Optional	Not possible			
A.4.1	(Standard) Explicit tracking mechanism linked to balances of electricity trading?	<i>Ex post contract tracking, e.g. as in Germany</i>	Yes	Optional	No			
A.6	Use of registries for explicit tracking		Mandatory for all explicit tracking	Optional	No registry available			
A.6.1	Type of registries		Unique European registry	Unique registry per country or domain	Several parallel registries	No registry		
A.7	Use of statistical averages (implicit tracking)	<i>(Note)</i>	No default value available	Limited to certain volumes/transactions	Unlimited			
A.7.1	Limitation of total share of statistical averages within portfolio?		Unlimited	Limited to a certain share				not generally limited but generally only accepted in exceptional cases
A.7.2	Limitation of use of statistical averages for certain transactions?		Unlimited	Limitation for certain transactions				not generally limited but generally only accepted in exceptional cases
A.7.3	Type of statistical average used		European (more than UCTE)	Transmission system, e.g. UCTE	Region (several countries)	National	Sub-national	
A.7.4	Correction by attributes tracked explicitly	<i>Corrections result in a residual mix</i>	Unused certificates are collected for the residual mix and redeemed	Other forms of correction by all attributes being tracked explicitly	Other forms of correction by part of the attributes being tracked explicitly	No correction		
A.8	Handling of specific "low-information" processes	<i>Rating according to descriptors A.8.1 to A.8.5</i>	Ambitious approach	Moderate approach	Less ambitious approach			
A.8.1	Handling of imports without explicit tracking	<i>(note)</i>	use regional or national residual or production mix	Use national residual mix if available	Use European production mix	Use national production mix	Treat as "unknown origin"	
A.8.2	Handling of exports	<i>(note)</i>	Exports must be associated with explicit tracking information	Explicit tracking optional, otherwise use standard implicit tracking information	Use standard implicit tracking information	Default value different to the standard implicit tracking information	No regulation	

E-TRACK Scenarios				Scenario:	Option C	"Ambitious certificate system plus residual mix"				
List of Descriptors					26.04.2006					
No.	Descriptor			comment	State A	State B	State C	State D	State E	Explanations
A.8.2.1	Accounting of exported attributes				Exported attributes are recorded and must be deducted from exporter's attribute account	Exports of attributes are not accounted for	No regulation			
A.8.3	Handling of power exchange transactions without explicit tracking			<i>Power exchange could also set up e.g. a hydro exchange</i>	Use certificates	Use internal "exchange mix"	Use statistical average used for implicit tracking	Treat as "unknown origin"		
A.9	Measures for regional balancing of physical energy and attributes				Joint residual mix for all participating countries	Ex/Imports must be balanced (either attributes plus power or swap in attributes)	none			
B. Tracked information										
B.1	Qualification as GO			<i>Do accounting units specify whether they qualify as GO?</i>	RES and CHP	Only RES	Only CHP	No information		
B.2	Production period				Mandatory, standardised production periods	Mandatory, no standardised production periods	Optional	No information		
B.3	Issuing date of accounting unit				Mandatory	Optional	No information			
B.4	Energy sources				Detailed list of standard sources (coal, gas, nuclear etc.)	Standard clusters (e.g. nuclear, renewables, fossil&other)	No standardisation			
B.5	Qualification for high-efficiency CHP				Mandatory	Optional	No			
B.5.1	Basis for qualification of HE CHP				Based on CHP Directive	Other criteria	Not applicable			
B.6	Support				Support log, listing all relevant support	Earmark (y/n) for "major" support	No support information			
B.7	RES-E/HE-CHP target			<i>On EU level only relevant for RES-E</i>	RES and CHP	Only RES	Only CHP	No information		
B.8	Environmental indicators									
B.8.1	CO2 emissions			<i>GHG (CO2 equivalents) neglected here</i>	Plant-specific emissions recorded	Plant-specific combination of high/low emission attributes	Emissions of plant type	No CO2 information		
B.8.2	Nuclear waste				Plant-specific waste production recorded	Plant-specific combination of high/low waste production attributes	Waste production of plant type	No nuclear waste information		
B.8.3	Other			<i>SOx, NOx, dust etc.</i>	Additional envir. Indicators included	No inclusion of add. envir. indicators				
B.8.4	Basis of environmental indicators				Full upstream process chain analysis	Standardised factors for impact of upstream process chain	Only direct emissions, no process chain analysis			

E-TRACK Scenarios		Scenario:	Option C	"Ambitious certificate system plus residual mix"				
List of Descriptors			26.04.2006					
No.	Descriptor	comment	State A	State B	State C	State D	State E	Explanations
B.9	Specific information for quality labels	<i>E.g. EUGENE eligibility and additionality info</i>	Mandatory, standardised	Optional, standardised	Optional, not standardised	No		
C. Uses of tracking								
C.1	Tracking system used for disclosure		Mandatory	Optional	No			
C.2	Tracking system used for green power market		Mandatory	Optional	No			
C.3	Tracking system and support schemes	<i>For RES-E, CHP etc.</i>						
C.3.1	Facilitation of support scheme		Support facilitated through tracking scheme	Support facilitated by a separate tracking scheme	No tracking for support			
C.3.2	Transparency about support	<i>Linked to B.6</i>	Support recorded in tracked information	No provision of support information				
C.4	Tracking system and target accounting	<i>Linked to B.7</i>	Verification of target fully based on tracking system	Tracking of target eligibility for exports and imports	No tracking of target information			
C.5	Accounting units used for several purposes?	<i>This relates to the "multi-certificate" discussion</i>	Separate accounting units for disclosure, support and target	Constraints apply to accounting units for disclosure, support and target	Single accounting unit for disclosure, support and target	Disclosure is only purpose of tracking		
D. Reliability and verification measures								
D.1	Independent verification of tracking results		Mandatory for all participants	Selective verification by the regulator	Verification on voluntary basis only			
D.2	Redemption of accounting units		Mandatory for all uses	Mandatory for disclosure only	No requirements			

E-TRACK Scenarios			Scenario:	Draft Recommendation					
				28.04.2006					
No.	Descriptor		comment	State A	State B	State C	State D	State E	Explanations
A. General features of tracking scheme									
A.1	Explicit tracking for non-RES-E / non-HE-CHP generation?			Mandatory for all transactions	Mandatory, except undisclosed imports and purchases from power exchanges	Mandatory for long term contracts	Voluntary	Not possible	Mandatory for any kind of product differentiation or claims
A.2	Explicit tracking for RES-E and HE-CHP generation?		<i>E.g. via GOs</i>	Mandatory for RES-E and HE-CHP	Mandatory for part of RES-E and CHP	Voluntary	Not possible		mandatory if RES-E or CHP are used for disclosure
A.3	Use of standardised accounting units for explicit tracking		<i>E.g. certificates, tags</i>	Mandatory	Optional	Never			
A.3.1	Limited lifetime of accounting units			Acc.units can be used only for the calendar year of issuing	Acc.units can be used longer than the calendar year of issuing	Unlimited	Technically unlimited, but limited by regulations of tracking uses		Technically unlimited.
A.4	Explicit tracking can be de-linked from electricity contracts?			Yes, standard	Optional	Not possible			
A.4.1	(Standard) Explicit tracking mechanism linked to balances of electricity trading?		<i>Ex post contract tracking, e.g. as in Germany</i>	Yes	Optional	No			
A.6	Use of registries for explicit tracking			Mandatory for all explicit tracking	Optional	No registry available			
A.6.1	Type of registries			Unique European registry	Unique registry per country or domain	Several parallel registries	No registry		
A.7	Use of statistical averages (implicit tracking)		<i>(Note)</i>	No default value available	Limited to certain volumes/transactions	Unlimited			
A.7.1	Limitation of total share of statistical averages within portfolio?			Unlimited	Limited to a certain share				
A.7.2	Limitation of use of statistical averages for certain transactions?			Unlimited	Limitation for certain transactions				
A.7.3	Type of statistical average used			European (more than UCTE)	Transmission system, e.g. UCTE	Region (several countries)	National	Sub-national	covering all countries which use the E-TRACK system ("E-TRACK bubble")
A.7.4	Correction by attributes tracked explicitly		<i>Corrections result in a residual mix</i>	Unused certificates are collected for the residual mix and redeemed	Other forms of correction by all attributes being tracked explicitly	Other forms of correction by part of the attributes being tracked explicitly	No correction		
A.8	Handling of specific "low-information" processes		<i>Rating according to descriptors A.8.1 to A.8.5</i>	Ambitious approach	Moderate approach	Less ambitious approach			
A.8.1	Handling of imports without explicit tracking		<i>(note)</i>	use regional or national residual or production mix	Use national residual mix if available	Use European production mix	Use national production mix	Treat as "unknown origin"	
A.8.2	Handling of exports		<i>(note)</i>	Exports must be associated with explicit tracking information	Explicit tracking optional, otherwise use standard implicit tracking information	Use standard implicit tracking information	Default value different to the standard implicit tracking information	No regulation	

E-TRACK Scenarios				Scenario:	Draft Recommendation					
					28.04.2006					
No.	Descriptor			comment	State A	State B	State C	State D	State E	Explanations
A.8.2.1		Accounting of exported attributes				Exported attributes are recorded and must be deducted from exporter's attribute account	Exports of attributes are not accounted for	No regulation		
A.8.3		Handling of power exchange transactions without explicit tracking			<i>Power exchange could also set up e.g. a hydro exchange</i>	Use certificates	Use internal "exchange mix"	Use statistical average used for implicit tracking	Treat as "unknown origin"	
A.9		Measures for regional balancing of physical energy and attributes				Joint residual mix for all participating countries	Ex/Imports must be balanced (either attributes plus power or swap in attributes)	none		<i>The joint residual mix applies to the "E-TRACK bubble", and state B for other countries.</i>
B. Tracked information										
B.1		Qualification as GO			<i>Do accounting units specify whether they qualify as GO?</i>	RES and CHP	Only RES	Only CHP	No information	
B.2		Production period				Mandatory, standardised production periods	Mandatory, no standardised production periods	Optional	No information	
B.3		Issuing date of accounting unit				Mandatory	Optional	No information		
B.4		Energy sources				Detailed list of standard sources (coal, gas, nuclear etc.)	Standard clusters (e.g. nuclear, renewables, fossil&other)	No standardisation		
B.5		Qualification for high-efficiency CHP				Mandatory	Optional	No		
B.5.1		Basis for qualification of HE CHP				Based on CHP Directive	Other criteria	Not applicable		
B.6		Support				Support log, listing all relevant support	Earmark (y/n) for "major" support	No support information		
B.7		RES-E/HE-CHP target			<i>On EU level only relevant for RES-E</i>	RES and CHP	Only RES	Only CHP	No information	
B.8		Environmental indicators								
B.8.1		CO2 emissions			<i>GHG (CO2 equivalents) neglected here</i>	Plant-specific emissions recorded	Plant-specific combination of high/low emission attributes	Emissions of plant type	No CO2 information	<i>State C as a standard, but plant-specific emissions optional</i>
B.8.2		Nuclear waste				Plant-specific waste production recorded	Plant-specific combination of high/low waste production attributes	Waste production of plant type	No nuclear waste information	<i>State C as a standard, but plant-specific waste production optional</i>
B.8.3		Other			<i>SOx, NOx, dust etc.</i>	Additional envir. Indicators included	No inclusion of add. envir. indicators			

E-TRACK Scenarios			Scenario:	Draft Recommendation					
				28.04.2006					
No.	Descriptor	comment	State A	State B	State C	State D	State E	Explanations	
B.8.4	Basis of environmental indicators		Full upstream process chain analysis	Standardised factors for impact of upstream process chain	Only direct emissions, no process chain analysis				
B.9	Specific information for quality labels	<i>E.g. EUGENE eligibility and additionality info</i>	Mandatory, standardised	Optional, standardised	Optional, not standardised	No			
C. Uses of tracking									
C.1	Tracking system used for disclosure		Mandatory	Optional	No				
C.2	Tracking system used for green power market		Mandatory	Optional	No				
C.3	Tracking system and support schemes	<i>For RES-E, CHP etc.</i>							
C.3.1	Facilitation of support scheme		Support facilitated through tracking scheme	Support facilitated by a separate tracking scheme	No tracking for support				
C.3.2	Transparency about support	<i>Linked to B.6</i>	Support recorded in tracked information	No provision of support information					
C.4	Tracking system and target accounting	<i>Linked to B.7</i>	Verification of target fully based on tracking system	Tracking of target eligibility for exports and imports	No tracking of target information				
C.5	Accounting units used for several purposes?	<i>This relates to the "multi-certificate" discussion</i>	Separate accounting units for disclosure, support and target	Constraints apply to accounting units for disclosure, support and target	Single accounting unit for disclosure, support and target	Disclosure is only purpose of tracking			
D. Reliability and verification measures									
D.1	Independent verification of tracking results		Mandatory for all participants	Selective verification by the regulator	Verification on voluntary basis only				
D.2	Redemption of accounting units		Mandatory for all uses	Mandatory for disclosure only	No requirements				