

Second consultation workshop on electricity tracking

5 July 2006, ECN, Overhoeks/Shell Building, Boardroom, 15th Floor, Amsterdam
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Outline for the consultation workshop

1. Introduction
2. Status of the project
3. Discussion
4. Evaluation criteria for tracking options
5. Tracking options
6. Cost drivers of tracking systems
7. Outlook on the upcoming work in the project
8. Feedback

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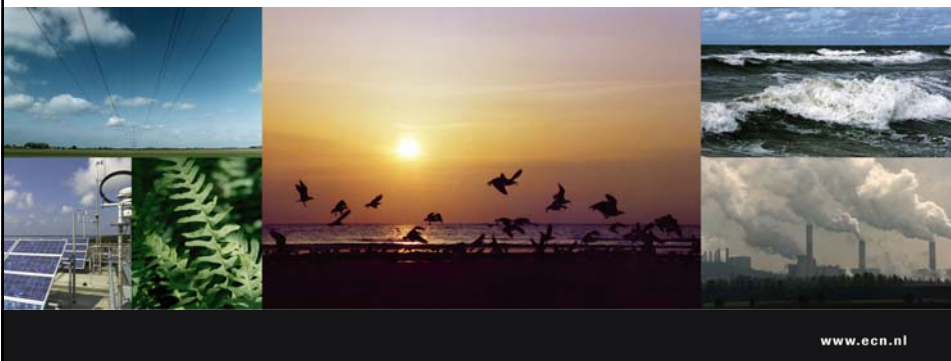
1. Introduction

Are there any comments to the notes from the last workshop?

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2. Status of the project



Project objectives

Overall goal of the project

- To draft a [harmonised standard](#) for tracking electricity generation attributes in Europe

Additional project objectives

- To cover [all relevant tracking requirements](#) which are imposed by European and national policies (disclosure, guarantees of origin, support schemes, Green Power etc.)
- To [support cross-border trade](#) of electricity and generation attributes
- To [avoid multiple counting](#) of electricity attributes (e.g. from renewable energy sources)
- To simplify [verification](#) of tracking procedures

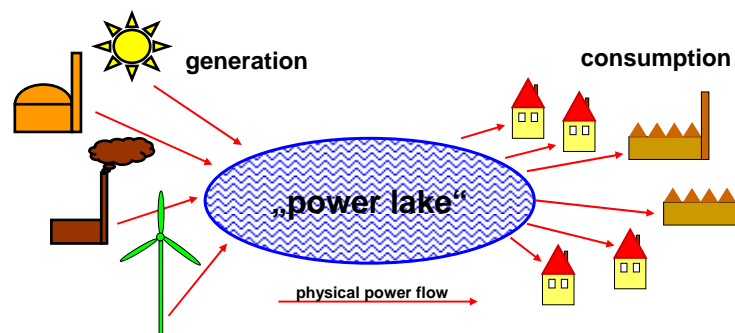
Point of departure (1/2)

- Several [EU and MS policies](#) require to account for certain “attributes” of electricity (generation)
 - Electricity disclosure / labelling
 - EU targets for market shares of certain fuel sources and technologies (e.g. RES-E)
 - Public support schemes, e.g. for RES-E and CHP
 - Differentiated electricity tax (based on e.g. fuel source)
 - Guarantees of Origin (GO) for RES-E and CHP
 - Green Power for voluntary demand
 - Statistical reporting on power generation and demand

Point of departure (2/2)

- Such “attributes”, which need to be accounted for, include
 - Fuel sources
 - Generation technologies (e.g. CHP)
 - CO₂ emissions and radioactive waste production (if not calculated based on average data)
 - Public support granted for generation
 - Accounting of RES-E generation for the EU target of the generation country
 - (Additional plant data?)
- Some of these attributes need to be “tracked” from generation to the final supplier or consumer
- The electricity market does not yet support such tracking in full detail, and not in a harmonised way

Tracking of electricity attributes (1/3)

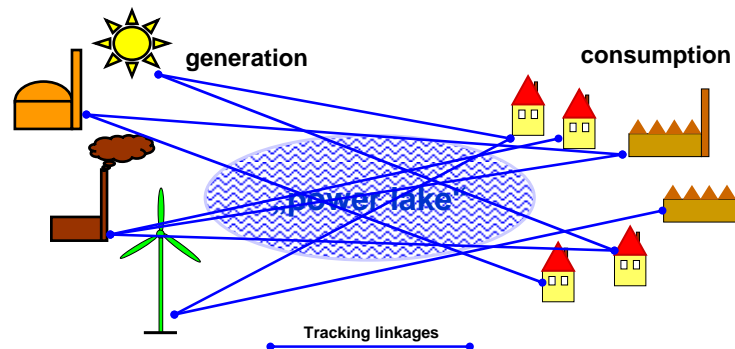


Definition of “tracking”:

Create unambiguous links between power plants and electricity sold to final consumers

Transfer information about power generation attributes to consumers or other parties (e.g. regulators, governments)

Tracking of electricity attributes (2/3)



Definition of "tracking":

Create unambiguous links between power plants and electricity sold to final consumers

Transfer information about power generation attributes to consumers or other parties (e.g. regulators, governments)

Tracking of electricity attributes (3/3)

"Explicit" vs. "implicit" tracking mechanisms:

"Explicit" tracking:

- Tracking based on a mechanism, which creates a link between generation and consumption
- Options for "explicit" tracking:
 - Tracking based on certificates
 - Contract based tracking

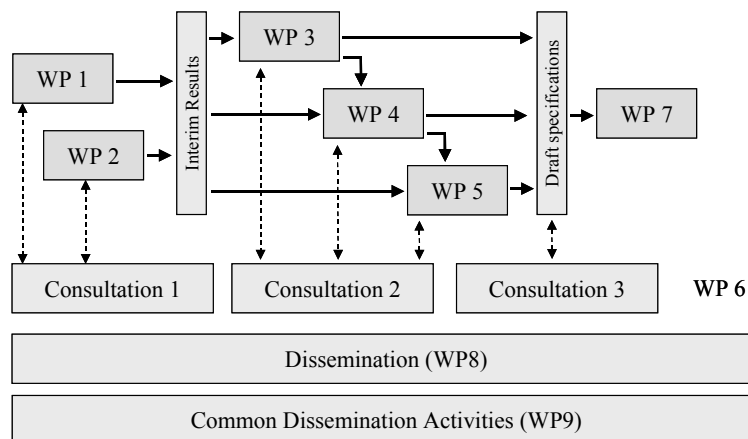
"Implicit" tracking:

- Tracking using statistical data or averages
- e.g. UCTE/Nordel generation mix, national generation mix, individual company generation mixes

Work packages and WP leaders

WP 1:	Analysis of existing allocation schemes	ECN
WP 2:	Analysis of the framework conditions for tracking	ECN
WP 3:	Non-technical specifications	Öko
WP 4:	Technical specifications	Pure Energi
WP 5:	Cost Assessment	EVA
WP 6:	Consultation Process	Öko
WP 7:	Finalisation of system specifications	Pure Energi
WP 8:	Dissemination	IT Power
WP 9:	Common Dissemination Activities	Öko
WP10:	Project Management	Öko

Logical project structure



Project schedule This WS mainly based on WP3

Project phases	Inception							Draft design							Review							Dissemination								
Duration of the project (in months)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Calendar year	2005							2006							2007															
WP 1: Analysis of existing allocation schemes	█	█	█	█	█	█																								
WP 2: Analysis of the framework conditions for tracking	█	█	█	█	█	█	█																							
WP 3: Non-technical specifications								█	█	█	█	█	█	█	█	█														
WP 4: Technical specifications								█	█	█	█	█	█	█	█	█														
WP 5: Cost Assessment								█	█	█	█	█	█	█	█	█														
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WP 7: Finalisation of system specifications								█	█	█	█	█	█	█	█	█														
WP 8: Dissemination								█	█	█	█	█	█	█	█	█														
WP 9: Common Dissemination Activities								█	█	█	█	█	█	█	█	█														
Project Coordination								█	█	█	█	█	█	█	█	█														
Project meetings		x				x						x							x						x					
Consultation workshops			x								(x)								x											
Project Conference																											x			
Advisory Group			x							x									x								x			
Deliverables																														

Some general findings from WP1

- The majority of EU15 has finished implementation of RE-GO, but no GOs have been issued yet in NEU10
 - 12 countries have chosen advanced implementation or have integrated RE-GO into their policies
- 14 out of 31 European countries have implemented legislation regarding disclosure
 - Only part of these countries disclose CO₂ emissions and radioactive waste besides the fuel mix
 - 8 out of the 14 will use RE-GO for disclosure
- There is a **clear lack** of a tracking mechanism which supports an Internal Market for electricity.

Some general conclusions from WP1 (1/2)

- The combination of explicit and implicit tracking currently leads to multiple counting of attributes and loss of data
 - A residual mix should be used which removes all attributes from production statistics which have been tracked explicitly
 - Central bodies should collect aggregated data on explicit tracking of electricity and should develop the residual mix
- Extensive implicit tracking would lead to useless information
 - The use of a residual mix should be limited to the extent necessary for the functioning of electricity markets
- If GO are not integrated in disclosure schemes, then this can lead to multiple counting
 - The policy instruments RE-GO (and CHP-GO) and disclosure need to be coordinated and linked

Some general conclusions from WP1 (2/2)

- Besides GO for RES-E and for HE-CHP, there should be an instrument for explicit tracking of other generation as well (e.g. "disclosure certificates")
- Redemption should be introduced for GO and other types of certificates in order to avoid multiple counting
- The relation of support schemes to electricity tracking and disclosure should be clarified
 - The coexistence of certificates used for support schemes and GO can lead to confusion and multiple counting
 - Some feed-in schemes do not specify the ownership of the attributes of supported generation
- The impact of cross-border transfers of RES-E with or without GO to the accounting for the indicative targets for RES-E in 2010 should be clarified

Some conclusions from WP2

- Experiences gained with partial tracking schemes used for feed-in tariffs, quota obligations etc. can be useful for implementing more comprehensive tracking mechanisms
- Variations in implementation of GO and disclosure are a challenge for a coordinated European tracking system
- The views from stakeholders on a tracking standard vary, based on the specific interests represented.
- However most parties involved agree that:
 - Any tracking system must be reliable and accurate
 - The tracking system may not hinder electricity markets
 - The cost/benefit ratio must be reasonable
- The **preferred tracking system** should feature an efficient mechanism for explicit tracking, preferably based on certificates, plus a residual mix

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3. Discussion

Recent developments in the Netherlands, Belgium and Luxemburg



Specific conclusions on the Netherlands

- A TREC system in operation via TenneT since 2000.
- Electricity market fully opened since July 2004.
- About 2 million consumers have switched to green electricity
- RES-E/CHP support via so-called MEP¹ tariffs, which is a FIT
- RES-E (possibly supported by MEP) can be used as GO
- CHP supported by MEP, but cannot be used as GO
- Disclosure based on GO for RES-E, other electricity based on:
 - the national mix for traded electricity (OTC and APX),
 - the national mix of country of origin (excluding green part) for bilateral import,
 - the producer mix for own/domestic production.

¹ MEP = milieukwaliteit van elektriciteitsproductie

Specific conclusions on Belgium

- Four regulatory bodies, with CREG at Federal level.
- Great variance between guaranteed prices of green certificates at Federal level and Flanders (150 vs 450 €/MWh for solar) pg 50-51
- Flanders (VREG):
 - Quota obligation based on green certificates since 2002
 - Quota obligation for CHP certificates since 2005
 - Also accounts for GO.
- Wallonia (CWaPE):
 - Quota obligation based on green certificates since 2003
 - Intended both for RES-E and CHP-E.
 - CGO (initially) → LGO (by 2006)
- Brussels (IBGE BIM):
 - no quota obligation,
 - RES-E, CHP-E stimulation by GO

Production technology	Guaranteed price [€/MWh]	Federal level	Flanders
Off shore wind		90	–
On shore wind		50	80
Hydro power, tidal, waves, geothermal		50	95
Solar power		150	450
Other RES-E (incl. biomass)		20	80

Specific conclusions on Luxemburg

- There is not much tracking needed as electricity is mainly imported from Germany (while industry is connected to Belgium)
- GO mainly used as a FIT for RES-E
- There is no (substantial) CHP
- Once a registry is set up, ILR will operate it.
- The GO and RECS systems co-exist

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4. Evaluation criteria for tracking options



A two-step consultation process

- Consultations include discussions in the Advisory Group and national consultation workshops
- **Step 1:**
 - Discuss evaluation criteria and a first draft recommendation
 - Cost and benefits cannot yet be addressed in detail
- **Step 2:**
 - Discuss revised draft recommendation
 - Cost and benefits have been assessed prior to consultation
 - Technical aspects will be taken into consideration
- Based on results from consultations, a final recommendation will be developed

Evaluation of different „tracking options“ – criteria based approach

Development of five criteria for comparative evaluation of different tracking options

- Informational value
- Accuracy
- Robustness
- Feasibility
- Flexibility

Criteria partly summarise multiple aspects

The criteria in particular (1/3)

Informational value

- Qualitative aspects of tracked information
- Added value for stakeholders (e.g. consumers, other market participants, regulators)
 - Distinction between suppliers / products
 - Verification of support schemes and use for national target accounting

Accuracy

- Quantitative aspects of tracked information (in ideal case)
- Level of systematic errors (particularly multiple counting)
- Level of random errors (expected margin of error)

The criteria in particular (2/3)

Robustness

- Resistance against distortions of information by actors involved (errors and fraud)
- Traceability of attributes (origin of attributes, activities and ownership)

Feasibility

- Cost/benefit ratio
- Effects on liquidity of markets
- Accordance to other conditions of markets and legislation
- Complexity
- (Expected) acceptance by stakeholders

The criteria in particular (3/3)

Flexibility

- Ability to adapt to framework conditions
 - in terms of different national or regional frameworks
 - in terms of changes over time
- Ability for a gradual (step-wise) implementation of the tracking scheme
- Ability to handle transactions with market participants outside of the “E-TRACK bubble”
- Ability to adapt to lessons learned over time

Application of the criteria

- Short textual description of the evaluation is crucial for explaining complex contexts
- For visualisation, a graph showing an indicative numeric assessment against the criteria is provided
- Current draft evaluations are [preliminary](#)
 - Cost and benefits (WP 5) are not yet fully taken into account
 - Technical aspects (WP 4) are assumed for the time being not to hamper the potentials of the tracking options, more detailed analysis is under way
 - Feedback from consultation process

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5. Tracking options



Scenarios as a tool for a structured analysis of options for tracking systems

- The analyses in WP 3, WP 4 and WP 5 are based on a number of scenarios on how tracking could be implemented
 - In the Consultation Document, the scenarios presented have been called “options” (for the design of tracking systems).
- The scenario tool provides a structured and harmonised basis for the discussion of tracking options
- The scenarios assume the implementation of one coordinated tracking system in one or several countries (“E-TRACK bubble”)
- “Exports” and “imports” refer to the interaction with countries or regions with different types of tracking schemes
- The individual scenarios under consideration should cover the relevant range of options
 - Individual scenarios take up features of existing schemes

Scenarios: Descriptors and their potential states (Examples)

	A	B	C	D
Use of registries for explicit tracking	Mandatory for all explicit tracking	Optional	No registry available	
Use of statistical averages (implicit tracking)	No default value available	Limited to certain volumes/ transactions	Unlimited	
Type of statistical average used	European (more than UCTE)	Transmission system, e.g. UCTE	Region (several countries)	National

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Major descriptors for the scenarios

General features of tracking scheme

- Use of explicit tracking
- Use of registries
- Use & type of statistical averages (implicit tracking)
- Handling of electricity without known attributes

Tracked information

- Energy sources
- Environmental indicators
- Support

Uses of tracking

- Inclusion of GO
- Disclosure
- Support schemes (facilitation of support or transparency only)
- RES-E target accounting

Reliability and verification measures

- Redemption
- Independent verification

Selection process

- Discussion and rough evaluation of a larger number of scenarios
- Pre-selection of three scenarios, used for a textual description and a more detailed evaluation
- Refinement of the pre-selected scenarios
- Development of a first draft recommendation (with elements from several scenarios)
- [Consultation on first draft recommendation \(current workshop\)](#)
- Refinement of recommendation, more detailed assessments
- Consultation on second draft recommendation (third workshop)
- Revised recommendation

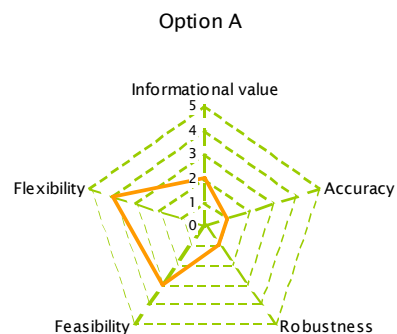
Tracking Option A: "Ex post contract tracking" (1)

- Attributes are allocated mainly based on the [net electricity trading activity](#) between market participants
- The allocation requires an [iterative, ex-post calculation](#) procedure, which approximates the "ideal" figures
- Power purchased from exchanges and undisclosed imports will be assigned with default data ([production statistics](#))
- [Other tracking options](#), including contracts with attributes and certificates are possible in parallel to the main scheme
- Energy sources are not standardised
- GO not integrated in the tracking scheme
- The whole system is [not mandatory](#) for disclosure

Tracking Option A: "Ex post contract tracking" (2)

Evaluation

- Ex post contract tracking is neither clearly explicit nor implicit
- System is very flexible, cost could be low
- Fits well with markets, but acceptance not clear
- Coexistence of tracking options (GO, certificates, ...)
- Statistics limited, however no residual mix
- Verification can be difficult



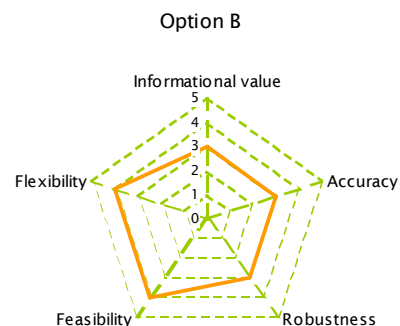
Tracking Option B: "Voluntary certificate system plus residual mix" (1)

- Explicit tracking based on **certificates**, **mandatory** for RES-E and HE-CHP, optional for all other generation
- Implicit tracking based on **regional residual mixes**; **caps** on the use of residual might be introduced
- Undisclosed imports: use exporters' residual mix (if available)
- Exports must be disclosed and registered (residual possible)
- Energy sources standardised, environmental indicators included
- **GO fully integrated** in the tracking scheme, RES-E targets can be verified based on tracking results
- The whole system is **mandatory only for RES-E and HE-CHP** (other options exist), redemption of certificates required
- Support for RES-E and HE-CHP can be independent from tracking certificates

Tracking Option B: "Voluntary certificate system plus residual mix" (2)

Evaluation

- Within the system, accuracy and robustness are high (RES-E, CHP)
- Informational value depends on market share of the residual mix
- Feasibility and flexibility relatively high
- Support certificates might confuse markets
- Availability of other tracking options reduces overall accuracy and robustness
- **This option could be an interim stage towards a binding system?**



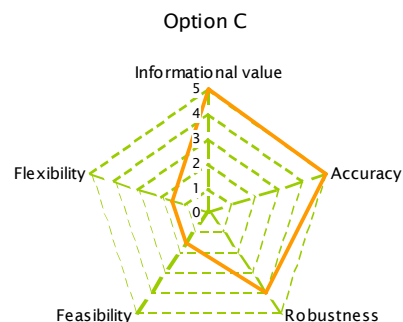
Tracking Option C: "Ambitious certificate system" (1)

- Fully **mandatory certificate system** for all types of generation
- **Residual mix** only allowed for **limited** purposes, e.g. losses (calculated from unused certificates on a European level)
- **GO fully integrated** in the tracking scheme, RES-E targets can be verified based on tracking results
- Single European certificate registry
- Exports and imports should be associated with attributes
- Energy sources standardised, environmental indicators and full information on support included
- System is **mandatory for disclosure**, no other tracking options
- Support for RES-E and HE-CHP can be included in tracking system (separate allocation procedure possible)

Tracking Option C: "Ambitious certificate system" (2)

Evaluation

- Comprehensive and exclusive tracking system
- High share of explicit tracking
- Mandatory redemption of certificates
- Robustness slightly reduced due to option for a separate support allocation mechanism
- Very strict system strongly reduces feasibility (e.g. automatic issuing of certificates)
- Advanced system has only very limited flexibility



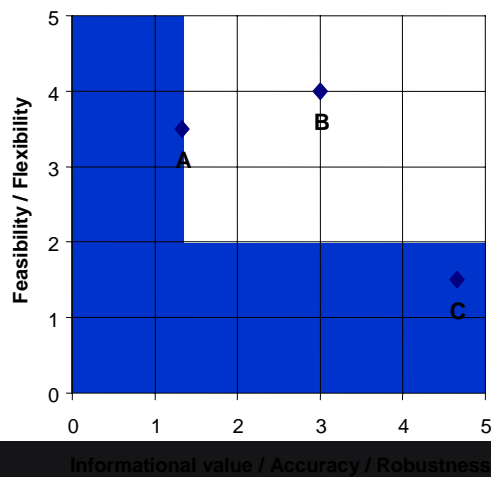
Scenario evaluation – rough numeric ranking

	A	B	C
Informational value	2	3	5
Accuracy	1	3	5
Robustness	1	3	4
Feasibility	3	4	1,5
Flexibility	4	4	1,5

Scenario evaluation – rough numeric ranking

	A	B	C
Informational value	2	3	5
Accuracy	1	3	5
Robustness	1	3	4
Feasibility	3	4	1,5
Flexibility	4	4	1,5

Scenario evaluation – rough numeric ranking



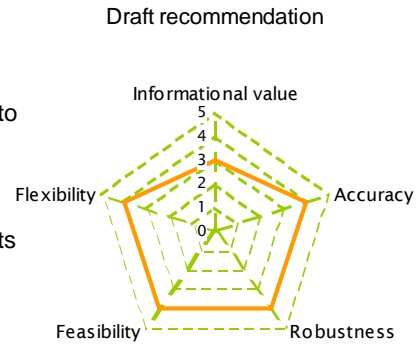
Draft recommendation (1)

- Certificate system for explicit tracking (redemption required), plus [European residual mix](#)
- [Use of certificates is optional](#), but all product specifications must be based on certificates
- No other limitation of the use of the residual mix
- [GO are fully integrated](#) in the tracking scheme, RES-E targets can be verified based on tracking results
- Undisclosed imports: use exporters residual mix (if available)
- Exports must be disclosed and registered (residual possible)
- Energy sources standardised, environmental indicators optional
- [System is mandatory for disclosure](#), no other tracking options
- Support for RES-E and HE-CHP usually separate from tracking system

Draft recommendation (2)

Evaluation

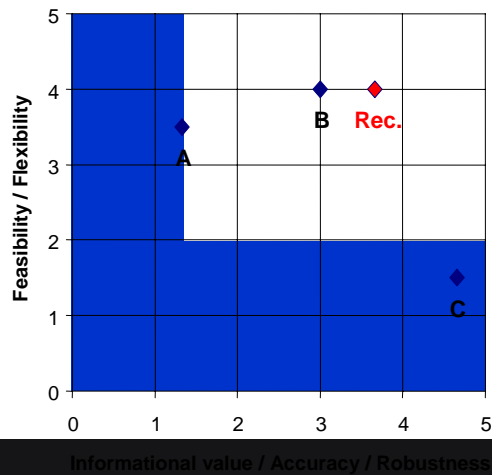
- Informational value high for specific products, **but lower for other offers**
 - Improvement over time?
- Accuracy and robustness high due to certificates plus residual
- Electricity markets are not affected more than necessary
- Voluntary use of certificates supports flexibility and might increase acceptance in industry
- Further development possible, e.g. by restricting the use of residual mix



Scenario evaluation – numeric ranking

	A	B	C	Recommend.
Informational value	2	3	5	3
Accuracy	1	3	5	4
Robustness	1	3	4	4
Feasibility	3	4	1,5	4
Flexibility	4	4	1,5	4

Scenario evaluation – rough numeric ranking



Questions for discussion

- Is the scenario approach helpful for understanding the options available?
- Should other options be selected for evaluation?
- What are your comments to the preliminary evaluation of options?
- What modifications would you suggest to the draft recommendation?

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6. Cost drivers of tracking systems



Cost-Benefit Analysis

- (Quantitative) Cost assessment for options for a European standard tracking scheme
- (Qualitative) Assessment of relevant benefits
- Analysis based on
 - Experiences of operators of tracking systems
 - Discussions with parties probably being involved in implementation and operation of a tracking system
 - Desktop research
- Recommendations on the distribution of costs will be formulated
- Status of the Work Package
 - Relevant cost drivers have been identified
 - Stakeholders are commenting on these based on a questionnaire

Cost drivers: System development and implementation

- Setting up organisational structures
- Composing detailed system specifications
- Technical development (software, registry, ...)
- Collection of data input
- Development of interfaces between national domains
- Capacity building (market actors, users, ...)

Cost drivers: Overall system operation and adaptation

- Governance of the overall system
- Operation and maintenance of the system
 - Hardware
 - Software
 - Data handling
- User support
- Further development according to policy development and to lessons learned

Cost drivers: System operation

Issuing aspects

- Plant certification and auditing
- Collection of plant data and generation data
- Verification

Transfer aspects

- Handling of information transfer (e.g. certificate transfers)

Usage and redemption aspects

- Conversion of data into format for final use (e.g. disclosure)
- Verification of output data
- Calculation of residual mix (if appropriate)

Next steps of the Work Package

- When the proposed European tracking scheme is developed in more detail, a second questionnaire addressing the national stakeholders will be used for improvements and refining of the cost assessment
- Draft Deliverables expected August 2006 and will be subject to the third round of consultations in October 2006

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7. Outlook on the upcoming work in the project



Project schedule

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Project Coordination																													
Project meetings		KO					X																						
Consultation workshops				X							(X)										X								
Project Conference																													
Advisory Group			X							X																			
Deliverables																													

Next steps of work and further consultations

Advisory Group meeting Second round of consultations	May / June 2006
Refinement of preferred tracking approach	August 2006
Third round of consultations, Advisory Group meeting	October 2006
Final draft of system specifications and recommendations	January 2007
Dissemination activities	until June 2007 (project termination)

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8. Feedback





Energy research Centre of the Netherlands

The end

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