



EUROPEAN COMMISSION

Directorate-General for Energy and Transport

Directorate-General for Enterprise and Industry

Ecodesign Directive Workshop – 21 November 2006

Methodology for Preparatory Studies



Methodology for the Ecodesign of Energy-Using Products Directive (MEEuP)

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Article 15 on implementing measures of the Directive

The Commission should check product parameters to see if it fulfils the criteria of Article 15:

- Significant trade & sales (> 200.000 units/year)
- Significant environmental impact (strategic priorities in 6th EAP, detailed in Annex II of EuP)
- Significant improvement (whilst no excessive costs)

Also many other elements to consider when preparing requirements, e.g.:

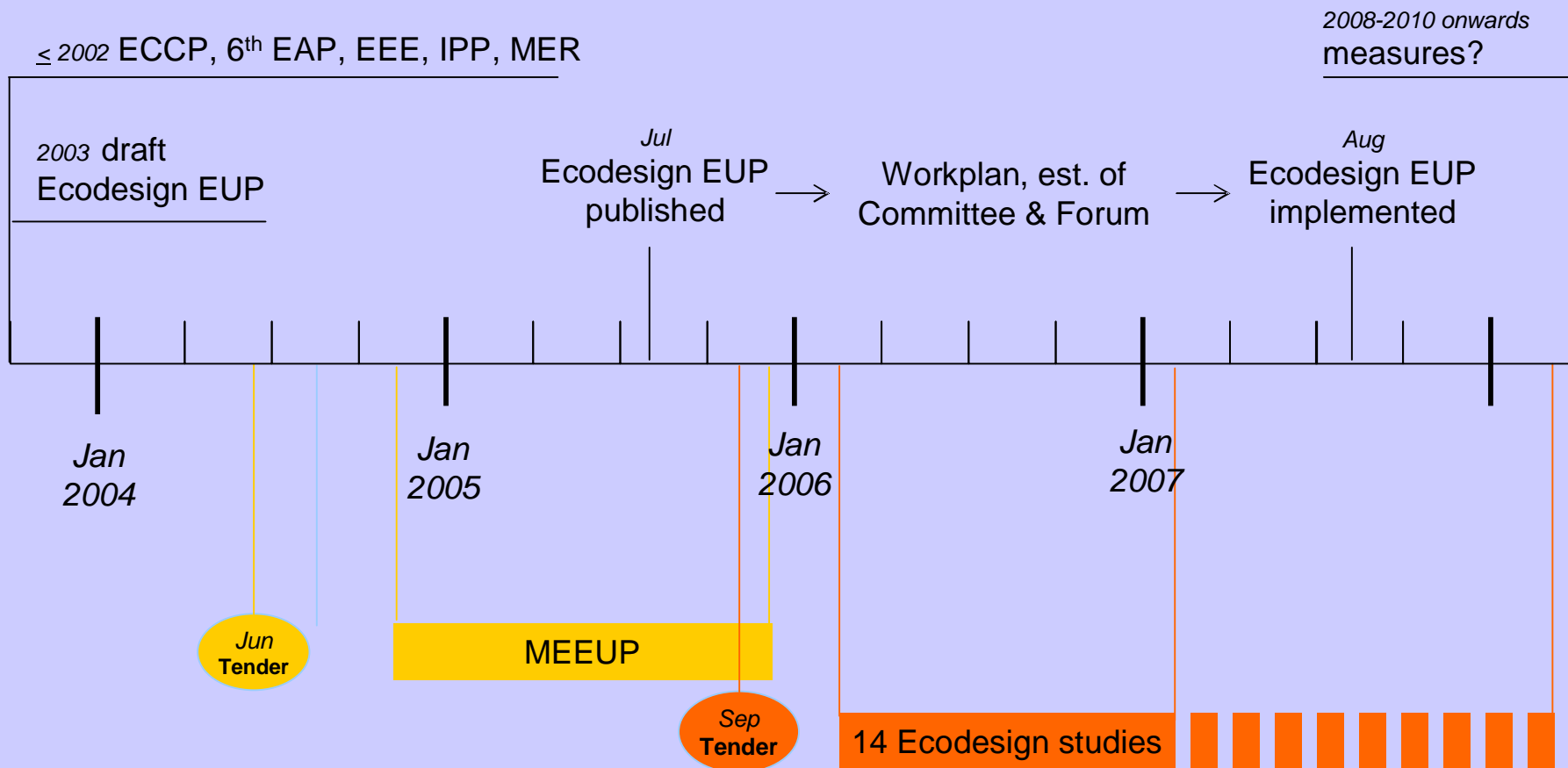
- relevant legislation
- stakeholder consultation
- acceptable impacts
- verifiable by market surveillance
etc.



Aim of the methodology:
allowing to evaluate
whether and to which extent
various EuPs fulfill the criteria of the Directive

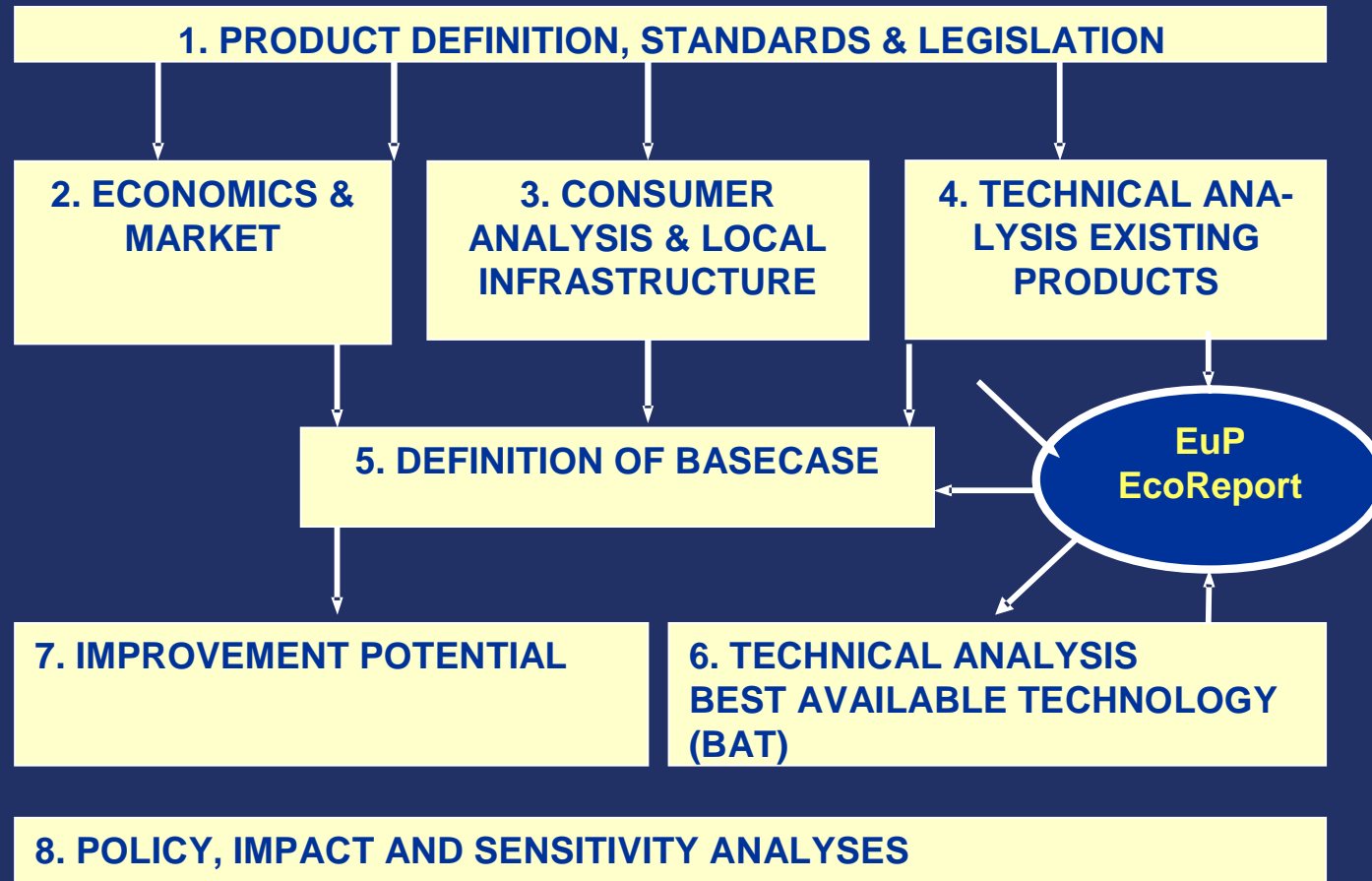


Timeline





Structure of the Methodology





Task 1: Product definition

- Product definitions (functionality !)
- Standards (harmonised, for performance, energy, testing)
- Legislation
(incl. initiatives such as (eco-)labelling, voluntary agreements)



Task 2: Economic analysis

- Generic economic data (trade, market value)
- Stock and market (now and future reference years)
- Trends (market trends, product trends, societal)
- Consumer expenditure (costs)



Task 3: Consumer perspective

- User defined parameters (real-life usage data)
- Local infrastructure (e.g possible barriers)



Task 4: Technical Analysis Existing products

- Production (bill-of-materials)
- Distribution
- Use product (m.i. energy consumption)
system (interaction product in wider system context)
- End-of-life



Task 5: Basecase & environmental assessment

- Product-specific inputs (for Ecoreport –next slide-)
- Basecase (reference product)
- Basecase LCC - life cycle costs
- EU totals – sales (sales + future use/disposal)
- EU totals – system (sales + current use/disposal)



(ct'd) MEEuP Ecoreport

- cradle-to-grave assessment
- environmental impact categories based on Directive
- life cycle impact assessment and weighting factors consistent with existing EU legislation
- treatment of recycling according to WEEE and current practice (scope of influence of the designer)



LCIA – life Cycle Impact Assessment

Table 1. Weighting factors per category

GHG emissions (air)	CO2	CO	N2O	CH4	CF4	C2F6	SF6	R134a	other
weighting --> CO2 eq. GWP-100	1	1.57	296	21	6500	9200	22200	1300	IPCC

Acidification emissions (air)	SOX	NOX	N2O	NH3	HF	HCl	H2S	H2SO4
AD weighting--> SO2 equivalent	1	0.7	1	1	1.6	0.88	1.49	0.65

Heavy Metals & PAH's (air)	PAHs	Cd	As	Ni	Cr	Cu	Hg	Pb	Zn	HMU'	AOX	Al	Mg	K	MU	CO
HM weighting -> Pb eq.	100	20	20	4	2	2	1	1	1	1	0.02	0.04	0.04	0.04	0.039	0.001

Heavy Metals (water)	Hg	Cd	As	Ni ⁺⁺	Pb /HMU	Cu ^{+ / ++}	Cr	Zn ⁺⁺	B	MU
HM Weighting factor--> Pb eq.	20	4	4	1	1	0.5	0.5	0.1	0.03	0.002

MU= Metals Unspecified
HMU= Heavy Metals Unsp.

Eutrophication emissions (water)	P	NO3-	NH4+	Other N	COD	DOC	BOD	TOC	Susp. Solids
EUP weighting--> SO2 equivalent	3.07	0.1	0.33	0.42	0.022	0.066	0.11	0.066	0.08

EC Directives and official EU references with threshold and conversion values from which the weighting factors are derived: *IPCC* (GWP), *EC 850/2004* (POP), *2001/81/EC* (SO_x, NO_x, NH₃, VOC), *1999/30/EC* (SO₂, NO_x, PM and Pb), *2000/69/EC* (aromatics, CO), *COM(2003)423* (As, Cd, Hg, Ni, PAH's), *1999/13/EC* (VOC), *EC 2037/2000* (ODP), *91/271/EC* & *98/15/EEC* (BOD, COD, P, N, susp. Solids to water), *76/464/EEC* (Metals etc. to water).



Unit indicators

DRAFT 2 VHK for European Commission - 13 April 2005

This document is subject to a legal notice (see p. 2 of table)



EuP EcoReport: MATERIALS & ENERGY UNIT INDICATORS

Material	Re- cyc %	Energy			Water	Waste	Emissions: To Air						To Water	
		prim / electr/ fd MJ / MJ / MJ	proc / cool ltr / ltr	haz / non g / g	GWP kg	AD g	VOC mg	POP i-Teq	PAH&H M mg	PM g	Metal mg	EUP g		
Plastics in kg														
1	LDPE	0%	78 / 13 / 52	3 / 45	4 / 44	1.90	7	490	0	1	1	0	0.0	
2	HDPE	0%	77 / 10 / 54	3 / 31	5 / 38	1.81	6	160	0	2	1	0	0.0	
3	LLDPE	0%	74 / 10 / 47	2 / 116	3 / 31	1.86	6	70	0	0	1	0	0.0	
4	PP	0%	73 / 7 / 53	5 / 40	4 / 28	1.97	6	18	0	2	1	0	0.2	
5	PS	0%	87 / 4 / 48	5 / 177	1 22	2.79	17	0	0	604	2	1	0.0	
6	EPS	0%	84 / 3 / 48	6 / 176	1 38	2.70	18	0	0	304	2	1	0.1	
7	HI-PS	0%	92 / 5 / 49	6 / 186	1 30	2.90	19	0	0	304	2	1	0.1	
8	PVC	0%	57 / 11 / 23	11 / 62	5 67	2.16	15	0	0	0	3	1	0.3	
9	SAN	0%	89 / 4 / 47	6 / 163	4 / 32	3.00	14	0	0	2	2	1	0.2	
10	ABS	0%	95 / 7 / 46	9 / 165	10 92	3.32	18	0	0	9	3	3	0.6	



Waste scenarios

Table 6. Waste Scenario's: 2005 and 3 WEEE Scenario's: A= Business-as-Usual, B= Dematerialisation and C=Best Recycling.

Disposal scenario's	2005		A		B		C	
	kt	%	kt	%	kt	%	kt	%
TOTAL EuP waste	8500	100%	8075	95%	6800	80%	8925	105%
◇ Metals/ Glass fraction	6800	80%	6299	78%	4760	70%	7140	80%
◇ Plastics/ PWB fraction	1700	20%	1777	22%	2040	30%	1785	20%
● Processed	1275	15%	7671	95%	6460	95%	8479	95%
Metals/ Glass	1020		5984		4522		6783	
- Recycled	969	95%	5684	95%	4296	95%	6444	95%
- Landfill	51	5%	299	5%	226	5%	339	5%
Plastics/ PWBs	255		1688		1938		1696	
- Re-use	3	1%	17	1%	19	1%	85	5%
- Recycled	20	8%	152	9%	310	16%	1272	75%
- Thermal recycling	0	0%	0	0%	1550	80%	288	17%
- Haz. incinerated	232	91%	1519	90%	58	3%	51	3%
● Not processed								
- Landfill	7225	85%	404	5%	340	5%	446	5%
RECYCLING/ RE-USE	992	12%	5853	72%	4625	68%	7800	87%
THERMAL RECYCLING	0	0%	0	0%	1550	23%	288	3%
WASTE (Haz.inc.& landf.)	7508	88%	2222	28%	624	9%	836	9%



Product LCI

Nr	Life cycle Impact per product:	Date	Author
0	Dishwashers		0 vhk

Life Cycle phases -->	PRODUCTION			DISTRIBUTION	USE	END-OF-LIFE*			TOTAL
	Resources Use and Emissions	Material	Manuf.			Total	Disposal	Recycl.	

Materials		unit									
1	Bulk Plastics	g			12937			11643	1294	12937	0
2	TecPlastics	g			770			693	77	770	0
3	Ferro	g			22820			1141	21679	22820	0
4	Non-ferro	g			1330			67	1264	1330	0
5	Coating	g			0			0	0	0	0
6	Electronics	g			410			205	205	410	0
7	Misc.	g			9931			497	9434	9931	0
	Total weight	g			48198			14245	33953	48198	0

Other Resources & Waste							see note!				
							debit	credit			
8	Total Energy (GER)	MJ	2503	847	3350	594	42352	1053	739	315	46611
9	of which, electricity (In primary MJ)	MJ	300	472	772	1	38746	0	29	-29	39491
10	Water (process)	ltr	836	12	848	0	53043	0	25	-25	53865
11	Water (cooling)	ltr	1225	229	1454	0	15	0	33	-33	1435
12	Waste, non-haz / landfill	g	33459	2990	36449	313	49374	3602	89	3513	89649
13	Waste, hazardous/ incinerated	g	788	2	790	6	982	12541	30	12511	14290

Emissions (Air)											
14	Greenhouse Gases in GWP100	kg CO2 eq	120	48	168	37	1850	79	51	27	2082
15	Ozone Depletion, emissions	mg R-11 eq					negligible				
16	Acidification, emissions	g SO2 eq.	815	212	1027	360	10905	158	82	76	12368
17	Volatile Organic Compounds (VOC)	g	80	2	82	391	18	3	1	2	491
18	Persistent Organic Pollutants (POP)	ng i-Teq	329	34	364	2	281	25	0	25	671
19	Heavy Metals	mg Ni eq.	1273	81	1354	16	749	286	3	283	2403
	PAHs	mg Ni eq.	215	1	216	18	96	0	3	-3	327
20	Particulate Matter (PM, dust)	g	2569	36	2604	1368	435	1365	2	1363	5770

Emissions (Water)											
21	Heavy Metals	mg Hg/20	773	0	774	0	260	88	14	74	1108
22	Eutrophication	g N	31	1	31	0	5308	5	0	5	5344
23	Persistent Organic Pollutants (POP)	ng i-Teq					negligible				

*Note: Recycling credits only relate to recycling of plastics and electronics (excl. LCD/CRT). Recycling credits for metals and other fractions are already taken into account in the production phase.

Legal notice

This document does not necessarily reflect the view of the European Commission. It was drafted to the best of ability within budget restrictions. VHK and



Task 6: Technical analysis of Best Available Technology

- Identification of State-of-the-art (BAT)
 - in current available models
 - in future models
(prototypes, components, patented technology, etc.)
 - in extra-EU models

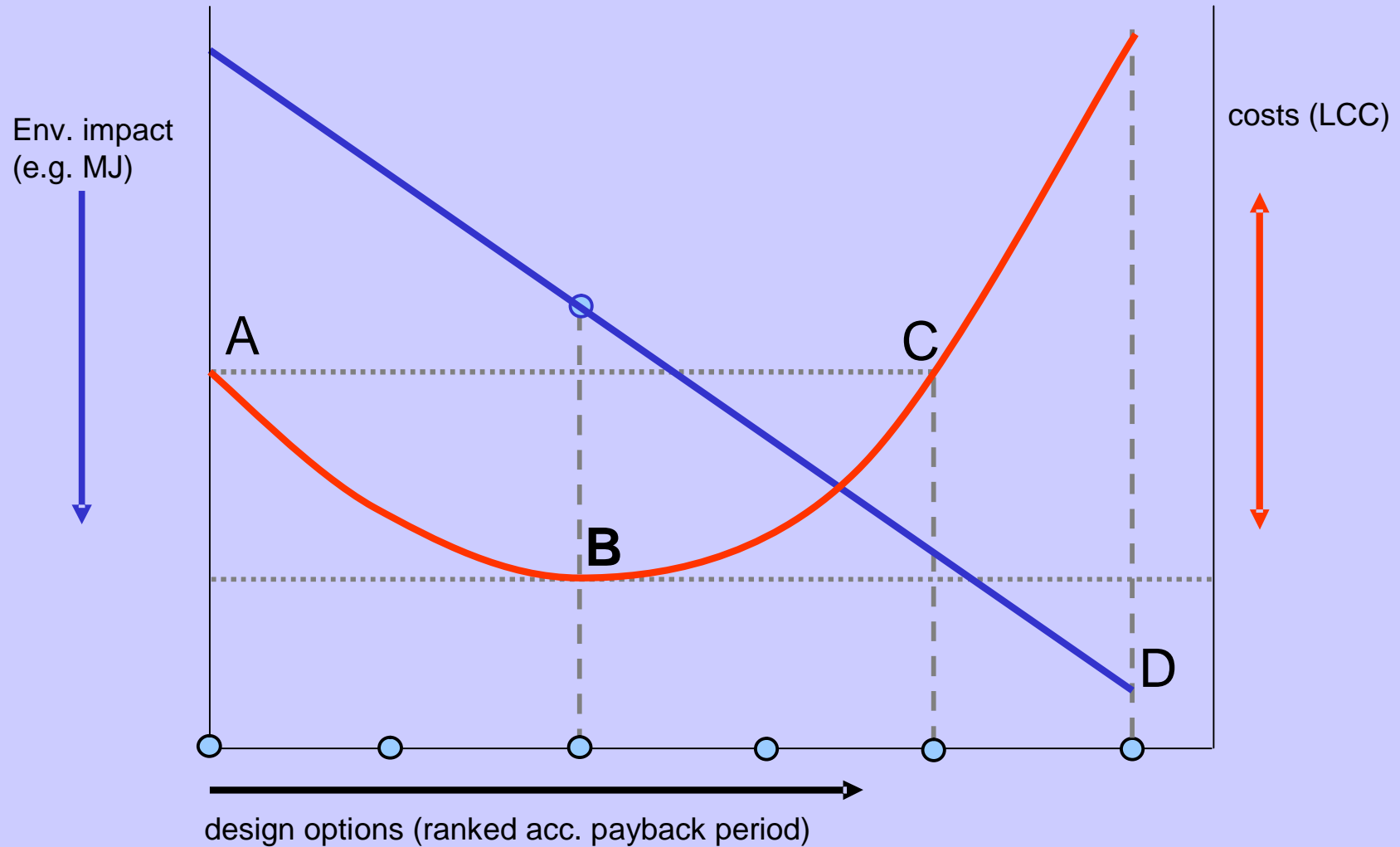


Task 7: Improvement potential

- Options (BAT, literature study, etc.)
- Impacts (environment, e.g energy)
- Costs (consumer expenditure data)
- LCC –next slide-
- Long term targets / system analysis (best not yet available technology)



Task 7 (detail): LCC





Task 8: Scenario analysis

- Policy & scenario analysis (stock model calculations)
- Impact analysis industry & consumers
- Sensitivity of main parameters (prices, lifetime, etc.)

All according to well known, established principles as applied in numerous SAVE studies (Energy Label)



Application areas of MEEuP

- Tool for policy makers, not directly for product manufacturers (although EcoReport may be useful for self-evaluating their products)
- It is to be applied consistently in all preparatory studies for potential product implementing measures