Energy Saving Potentials in the Residential/ Service Sector (Part 3: Sectoral Overview)

Barbara Schlomann, Tobias Fleiter, Tobias Boßmann, Rainer Elsland, Wolfgang Eichhammer

Fraunhofer ISI

Energy Savings 2030: on the 2050 pathway

Sector Validation Workshop
on behalf of the Coalition for Energy Savings
11 and 12 April 2013, Brussels

Programme Block 3

- **09h00-13h00 Block 3: Residential & service sectors including building, H&C, appliances and others**
- 09h00-11h00 Residential/Service sector buildings, H&C
- 11h00-11h15 Break
- 11h15-12h30 Residential and Service Sector Appliances
- **12h30-13h00 Sectoral view on Residential and Service Sector**

Fraunhofer ISI

Agenda

- Validation questions
- Introduction: The Background of the Fraunhofer Report on Saving Potentials 2050
- Methodology/data sources
- Main assumptions on drivers for energy consumption/main technology assumptions
- Sector findings: 2020, 2030, 2040 and 2050 potentials
- Main uncertainties
- Country specific variables (focus on 2030)

- Discussion

- Conclusion and outlook on the use of the results

Fraunhofer ISI

Validation questions

1. Do you agree with the approach taken and the assumptions made?

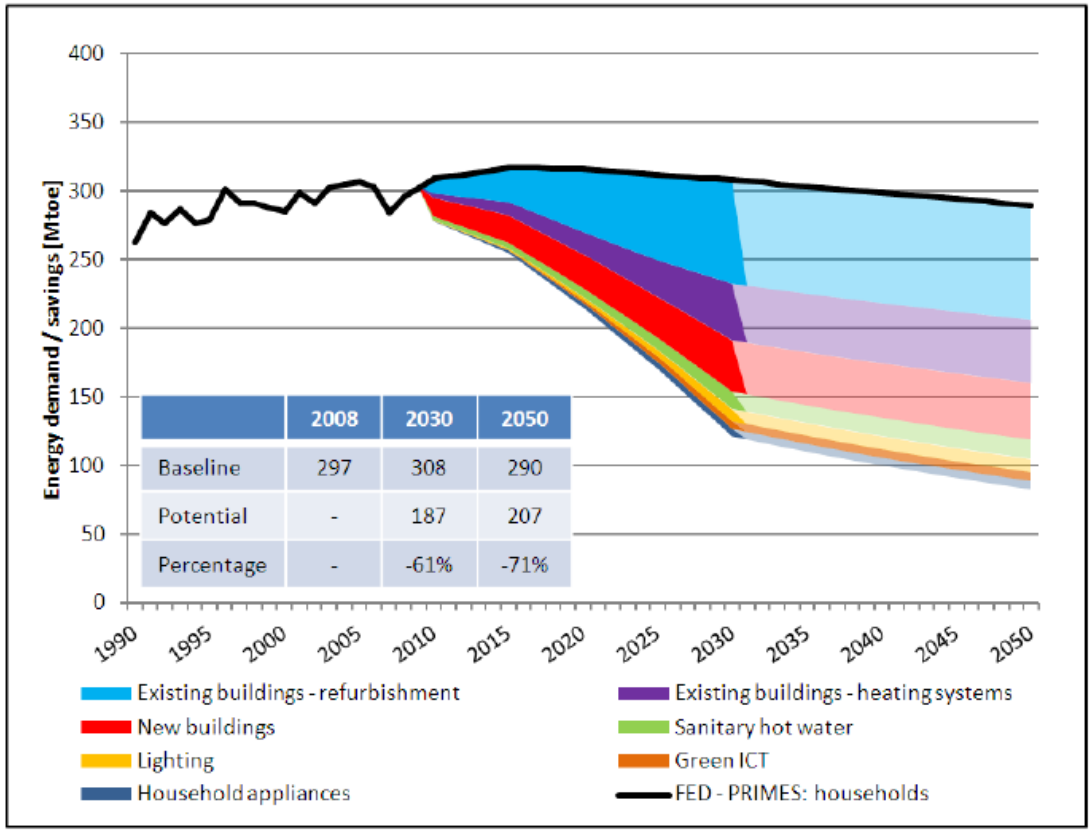
2. Do you agree with the national differences?

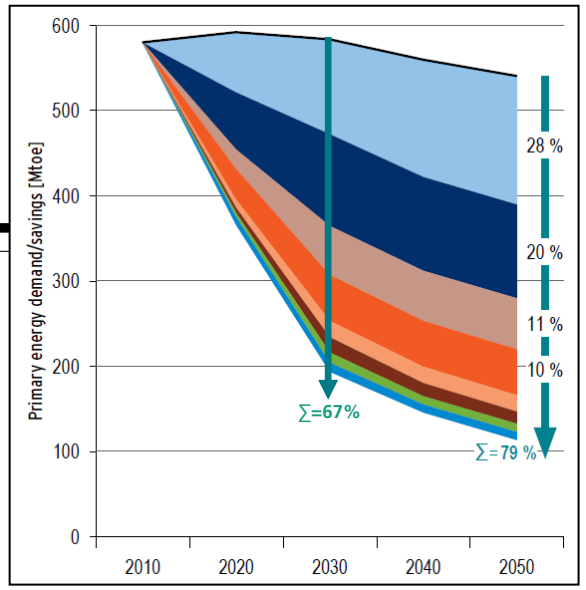
3. Do your agree with the saving potentials?

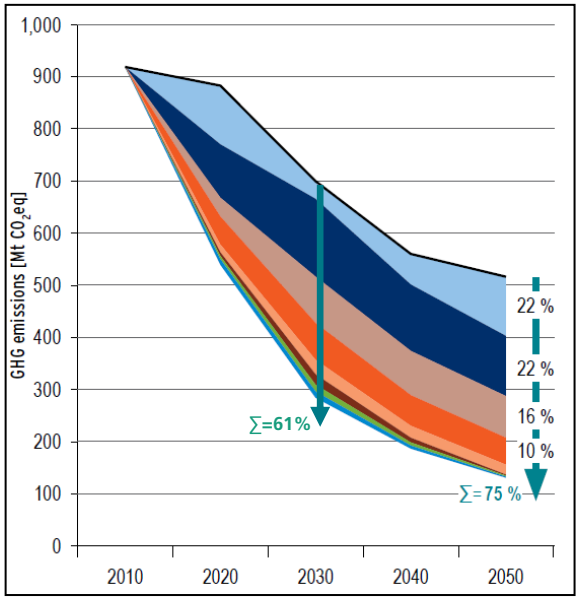
4. Can the potentials be used to set targets for 2030?

Fraunhofer ISI

Saving potentials
Household sector



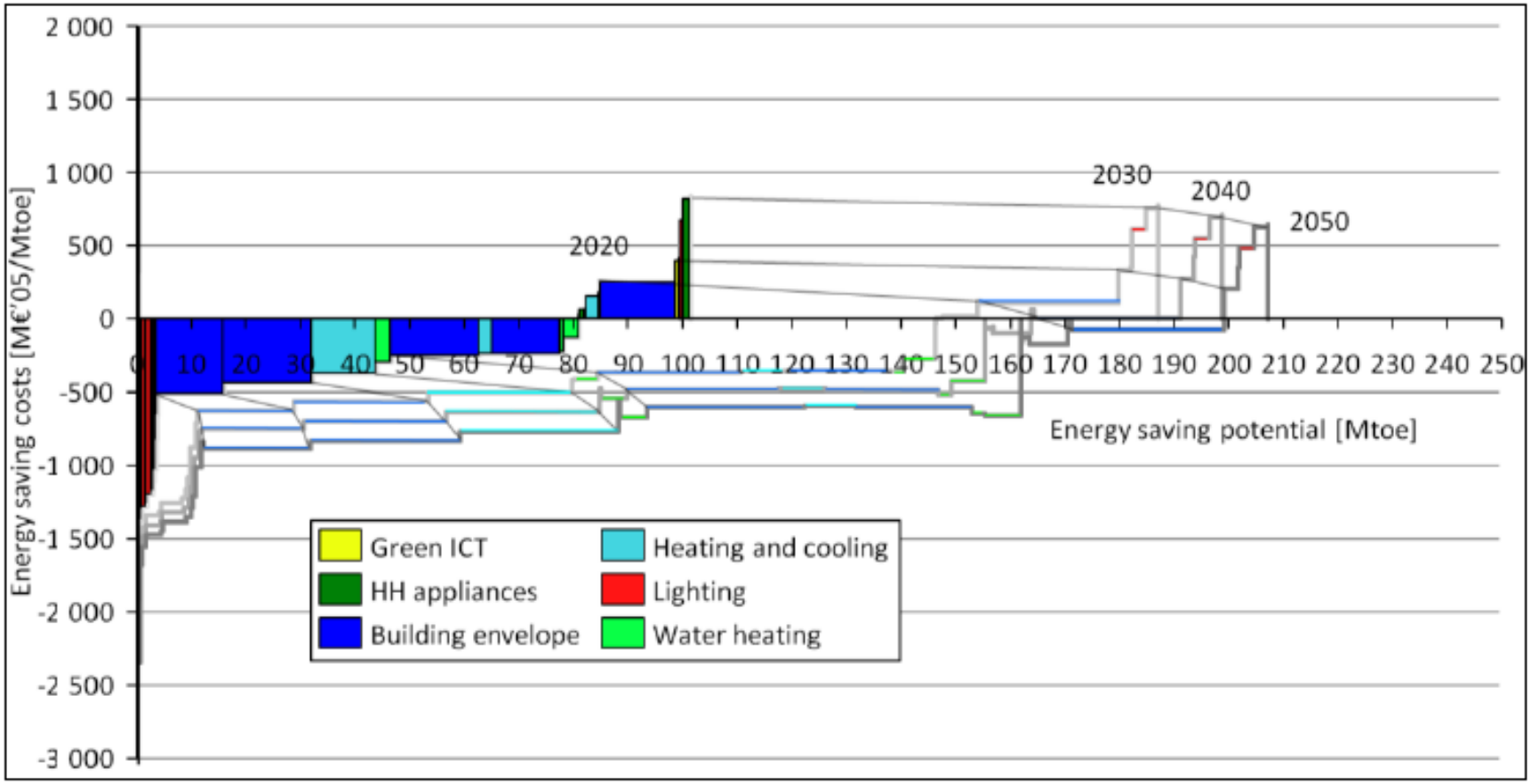




Conversion savings
Existings buildings – refurbishment
Existings buildings – heating systems
New buildings
Sanitary hot water
Efficient lighting
Green ICT
Household appliances
Baseline

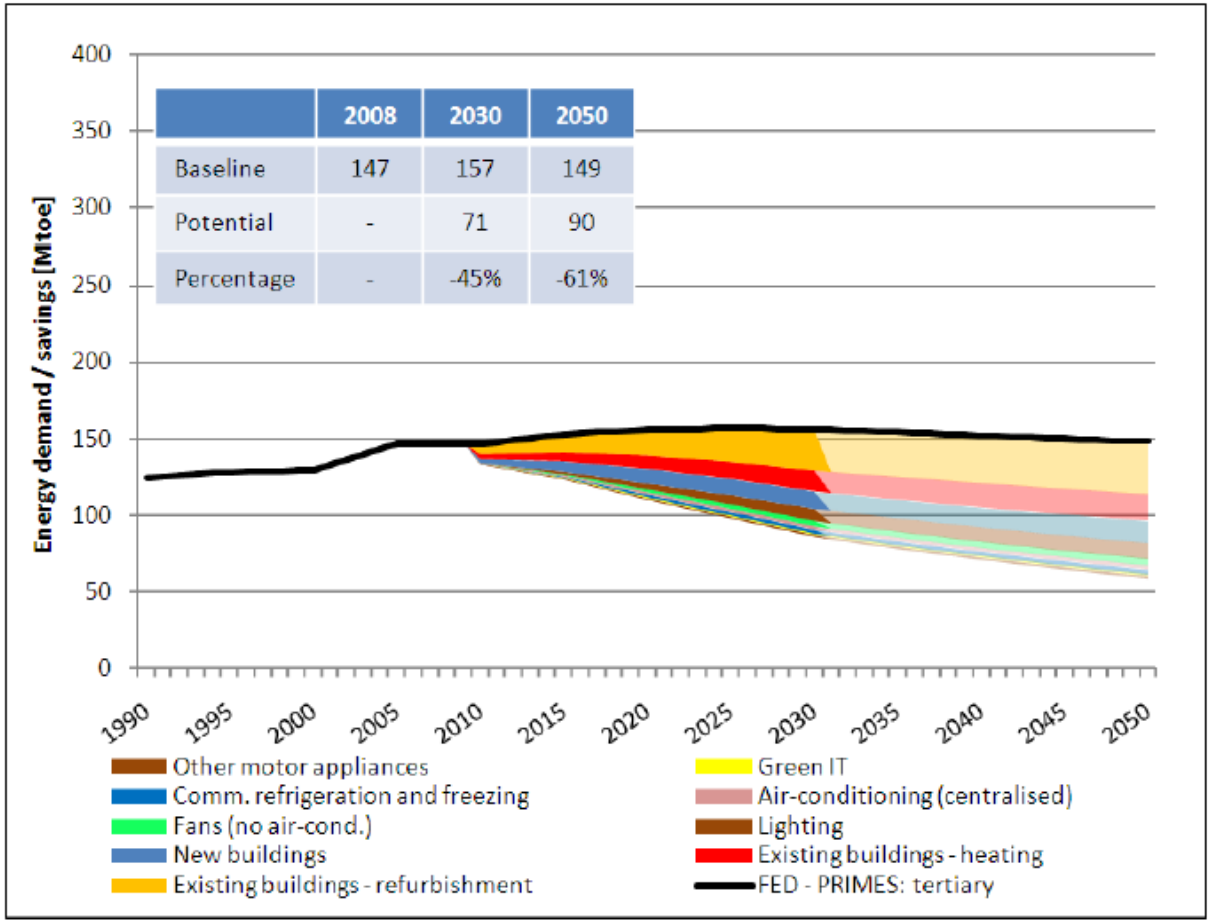
Fraunhofer ISI

Cost curve
Residential sector



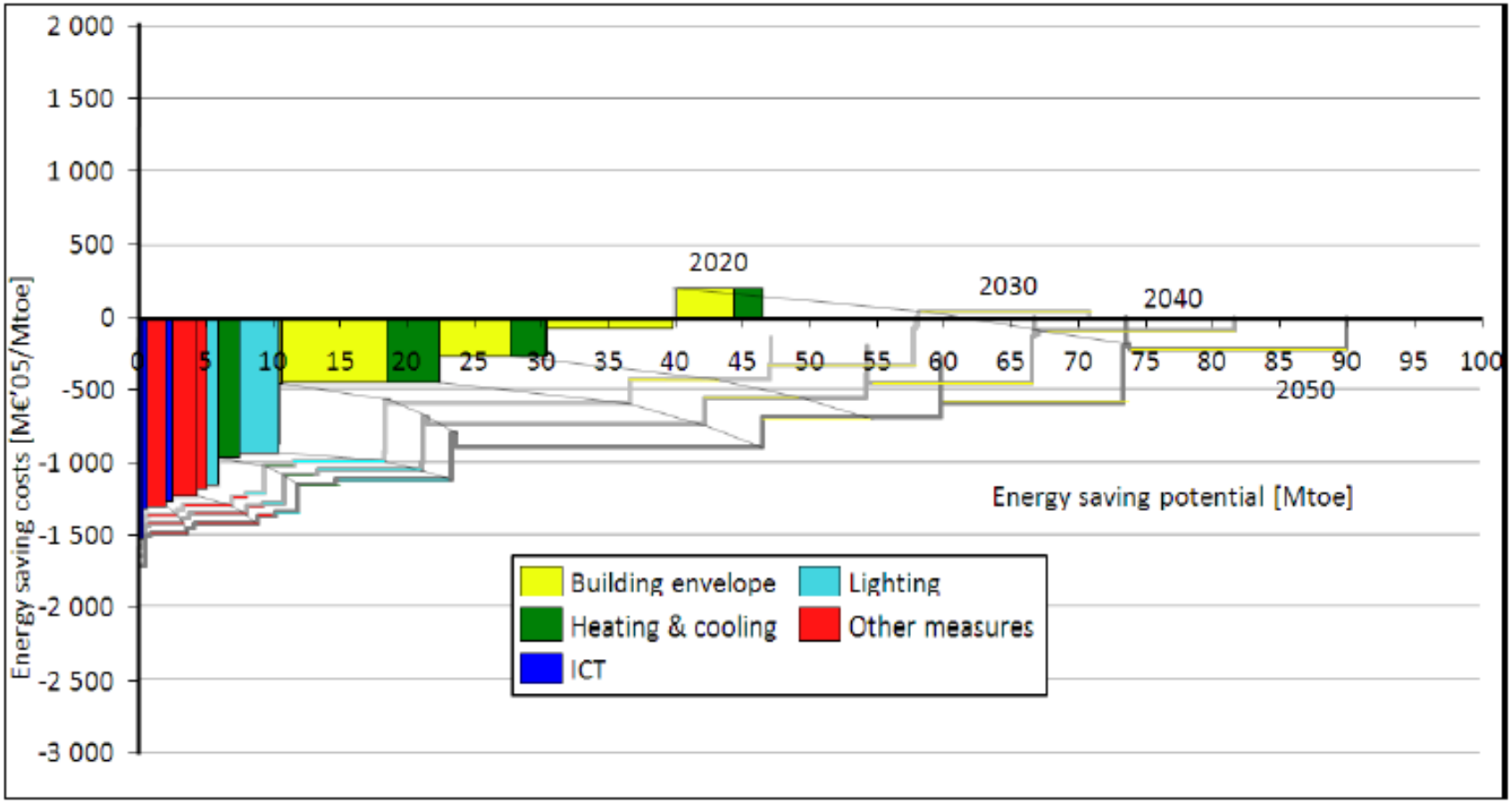
Fraunhofer ISI

Saving potentials
Tertiary sector



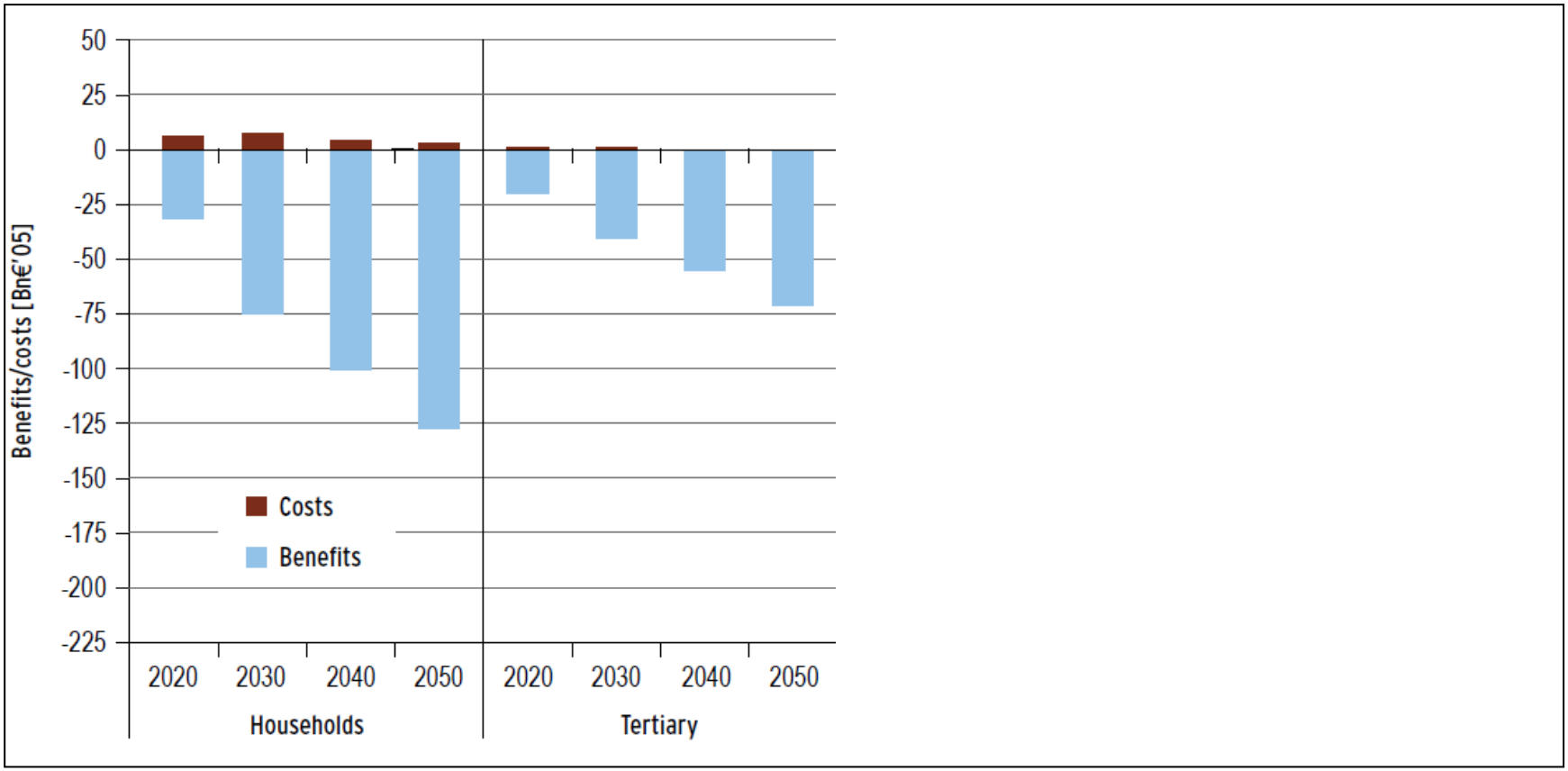
Fraunhofer ISI

Cost curve
Tertiary sector



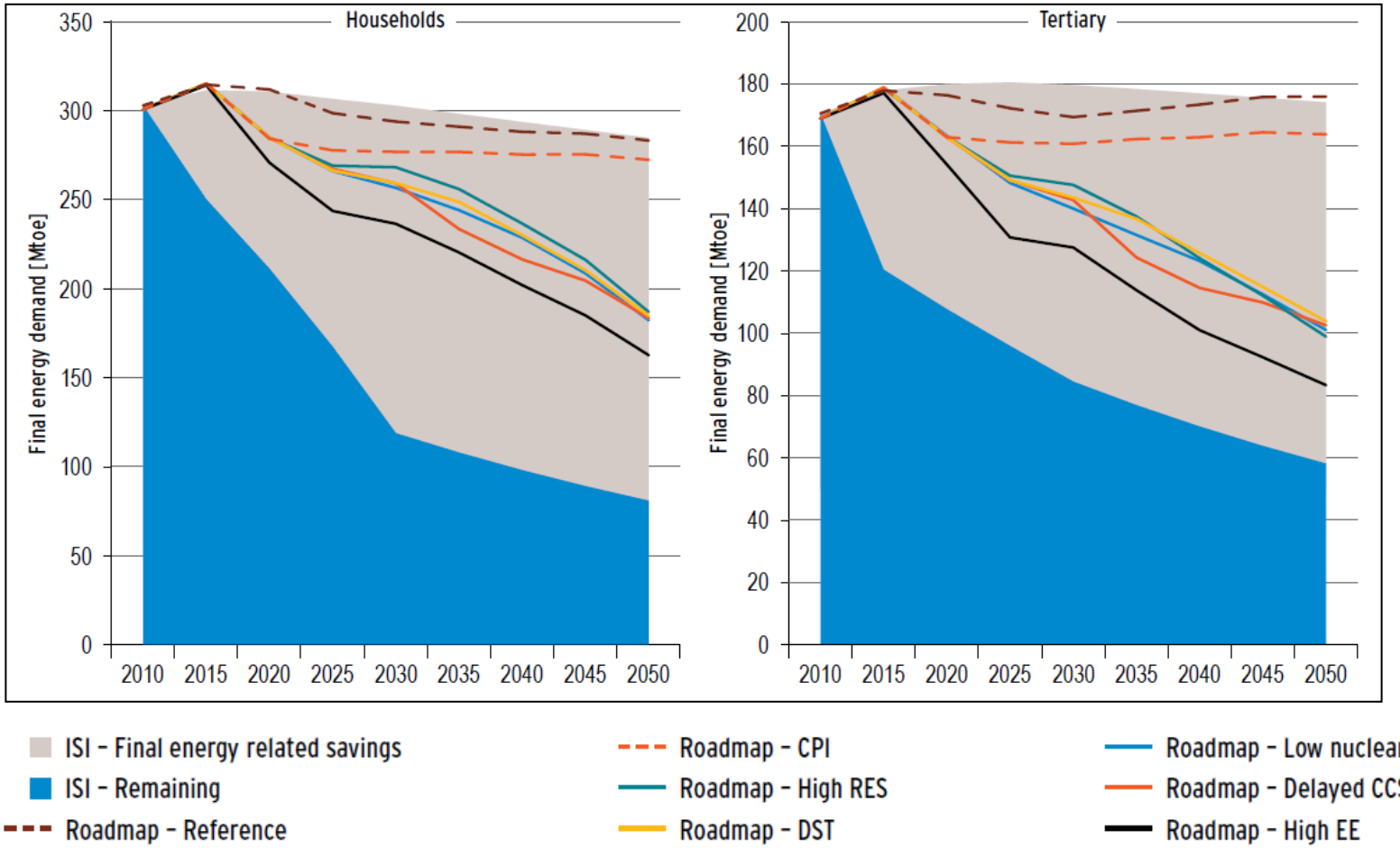
Fraunhofer ISI

Benefits and costs of economic and technical energy saving potentials



Fraunhofer ISI

Exploitation of final energy saving potentials in the EU Energy Roadmap 2050



Fraunhofer ISI

Validation questions

1. Do you agree with the approach taken and the assumptions made?
   >>> *Dealt with in end-use parts*

2. Do you agree with the national differences?
   >>> *Dealt with in end-use parts*

3. Do your agree with the saving potentials?

4. Can the potentials be used to set targets for 2030?

Fraunhofer ISI

Do your agree with the saving potentials? (Residential Sector)

		1990	2000	2010	2030		2030
		FED			Sav.P (FED)		Sav.P (PED)
		total	total	total	absolute number		absolute number
Sector	Energy efficiency / saving measure	[Mtoe]	[Mtoe]	[Mtoe]	[Mtoe]		[Mtoe]
HH	**Refurbishment of existing buildings**				-76		-90
	Efficient heating systems				-41		-48
	Efficient new buildings				-37		-44
	Others (e.g. electr. appliances)				-33		-50
	Electric appliances				-6		-9
	Lighting				-10		-15
	Green ICT				-6		-10
	Others				-10		-16
	Total saving potential				-187		-232
	Conversion savings						-93
	PRIMES/ADAM baseline	263	285	297	308		486
	Remaining FED (absolute & compared to baseline)				121 39%		161 33%
	Indicator: FED/Household						
	PRIMES/ADAM baseline	1,49	1,46	1,37	1,28		2,02
	Remaining FED				0,50		0,67

Fraunhofer ISI

Do your agree with the saving potentials? (Tertiary Sector)

		1990	2000	2010	2030		2030
		FED			Sav.P (FED)		Sav.P (PED)
		total	total	total	absolute number		absolute number
Sector	Energy efficiency / saving measure	[Mtoe]	[Mtoe]	[Mtoe]	[Mtoe]		[Mtoe]
TE	Refurbishment of existing building				-27		-32
	Efficient heating systems				-14		-20
	Efficient new buildings				-11		-13
	Efficient lighting (street & office)				-8		-14
	Others (e.g. Green IT, fans)				-11		-14
	Green ICT				-2		-2
	Others (other electric appliances)				-9		-12
	Total saving potential				-71		-93
	Conversion savings						-88
	PRIMES/ADAM baseline	125	130	147	157		342
	Remaining FED (absolute & compared to baseline)				86 55%		161 47%
	Indicator: FED/Mill. Euro value added						
	PRIMES/ADAM baseline	24,4	19,8	19,4	13,7		29,9
	Remaining FED				7,5		14,1

Fraunhofer ISI

Next steps for the study

- Summary of the main findings from the workshop with respect to the validation questions
- Short report bringing together the workshop findings and the presentations for the different sectors. Overall conclusions for the potentials.
- No further modelling work.
- Deriving of possible energy efficiency targets for 2030 based on the potentials taking into account possible observations from the workshop
- Interaction with the Institute for European Environmental Policy IEEP in the target definition process and the interaction of the energy efficiency targets with other targets (renewables, CO_2)

Fraunhofer ISI

Backup-Slides

Fraunhofer ISI

Summary of results for the year 2030

Saving potentials in 2030		House-holds	Ter-tiary	Indu-stry	Trans-port	Total
Final energy demand	2008 level [Mtoe]	296	147	317	374	1161
	Baseline [Mtoe]	308	185	344	379	1216
	Cost-efficient savings	47%	31%	21%	31%	32%
	Overall savings	61%	38%	26%	41%	41%
Net cost savings [bn €'05]	from cost-efficient savings	75	40	44	116	275
	from cost-efficient and near-economic savings	68	39	41	91	239
Primary energy demand	2008 level [Mtoe]					1802
	Baseline [Mtoe]	486	342	566	418	1813
	Conversion savings	19%	26%	21%	2%	17%
	Final energy related savings	48%	27%	20%	41%	34%
	Overall savings	67%	53%	41%	43%	50%
GHG emissions	1990 level [Mt CO_2eq]					3934
	Baseline [Mt CO_2eq]	716	472	896	1165	3249
	Conversion savings	5%	7%	5%	0%	3%
	Final energy related savings	56%	35%	26%	44%	40%
	Overall savings	61%	42%	31%	44%	44%

Note: in difference to the EED primary energy includes non-energy uses!

Fraunhofer ISI

Summary of results for the year 2050

Saving potentials in 2050		House-holds	Ter-tiary	Indu-stry	Trans-port	Total
Final energy demand	2008 level [Mtoe]	296	147	317	374	1161
	Baseline [Mtoe]	290	179	370	344	1183
	Cost-efficient savings	69%	60%	47%	44%	52%
	Overall savings	71%	60%	52%	53%	57%
Net cost savings [bn €'05]	from cost-efficient savings	127	71	105	210	514
	from cost-efficient and near-economic savings	124	71	102	191	488
Primary energy demand	2008 level [Mtoe]					1802
	Baseline [Mtoe]	451	323	592	368	1735
	Conversion savings	25%	36%	29%	4%	25%
	Final energy related savings	51%	32%	36%	51%	42%
	Overall savings	76%	68%	65%	55%	67%
GHG emissions	1990 level [Mt CO_2eq]					3934
	Baseline [Mt CO_2eq]	538	336	767	978	2619
	Conversion savings	21%	32%	20%	1%	15%
	Final energy related savings	55%	37%	49%	57%	52%
	Overall savings	76%	69%	70%	59%	67%

Note: in difference to the EED primary energy includes non-energy uses!

Fraunhofer ISI