

material efficiency schools energy saving
consumers industry transport carbon dioxide
wood chips traffic properties public sector
recycling biomass renewable energy solar energy climate change
energy efficiency energy auditing
service sector hydro power wind energy cooperation

Implementation phase of NREAP in Finland

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Kaunas, Nov 25, 2010

heat pump environment municipal sector construction

Content

- General framework
- Support schemes
- Sustainable bioenergy production and consumption

General framework

National RE target

- Finland's target for renewable energy is 38 % in 2020
- Gross final energy consumption 327 TWh in 2020
- RE 38 % share is equal to 124 TWh
- In 2005 the RE share was 87 TWh
- Need to increase **38 TWh** 2005 → 2020

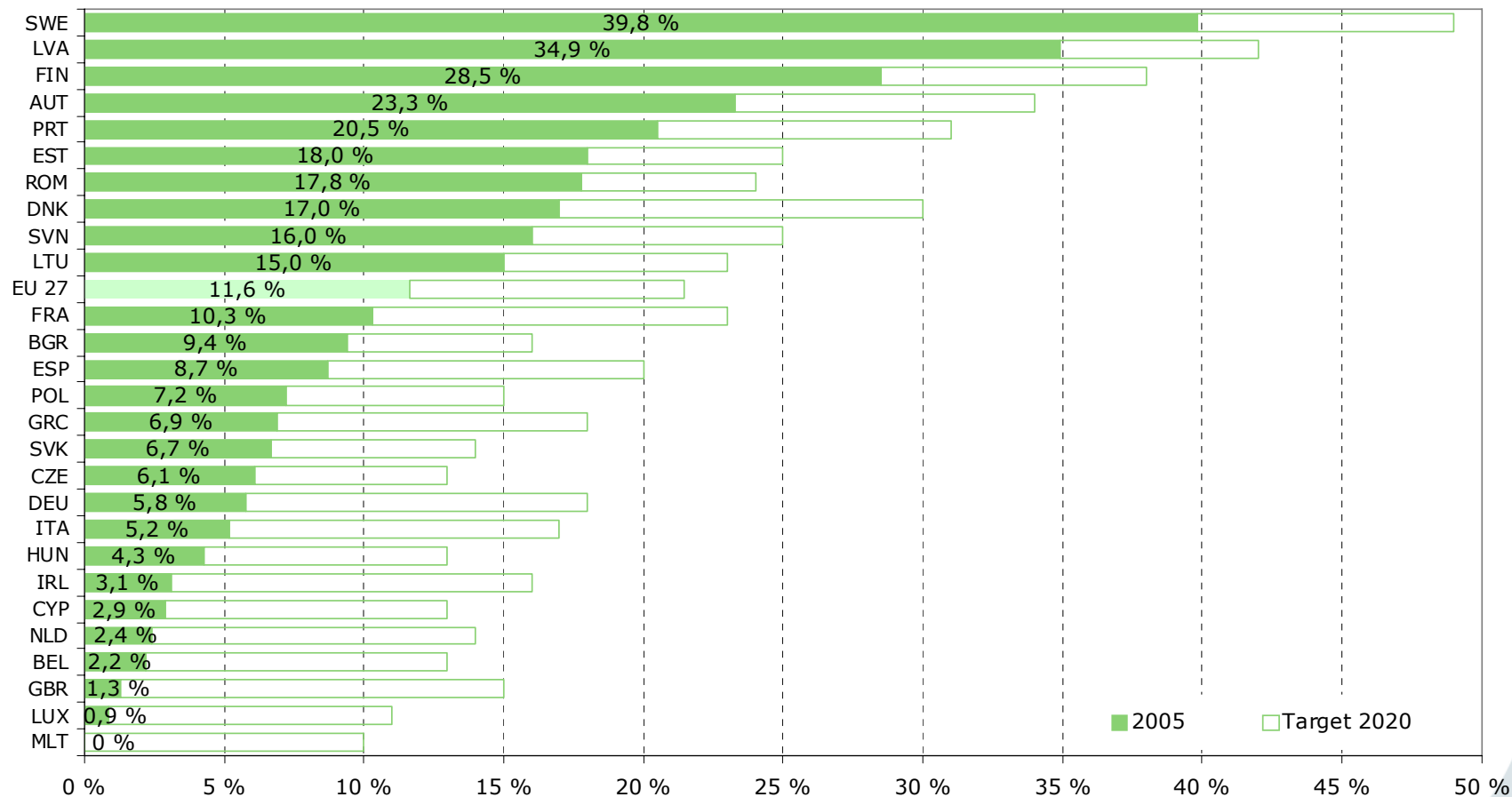
Renewable energy targets

RENEWABLE ENERGY, TWh	2005	2010	Change
Forest industry related			
Black liquer	37	38	1,1
Industry waste wood	20	19	-1,8
Total	57	56	-0,7
Policy measures			
Hydro	13,6	14	0,6
Wind	0	6	5,8
Forest residues	6	25	18,9
Firewood	13	12	-0,5
Heat pumps	2	8	6,1
Liquid biofuels	0	7	6,5
Biogas	0	1	0,7
Pellets	0	2	1,6
Recycled	2	2	0,7
Other RES (solar...)	0,4	0,4	0
Total	37	77	40
RES in primary energy	94	134	39,2
RES in final consumption	87	124	37,5
Final energy consumption	303	327	23,6
RES of final energy , %	28,5	38	9,5

Sectoral RES targets

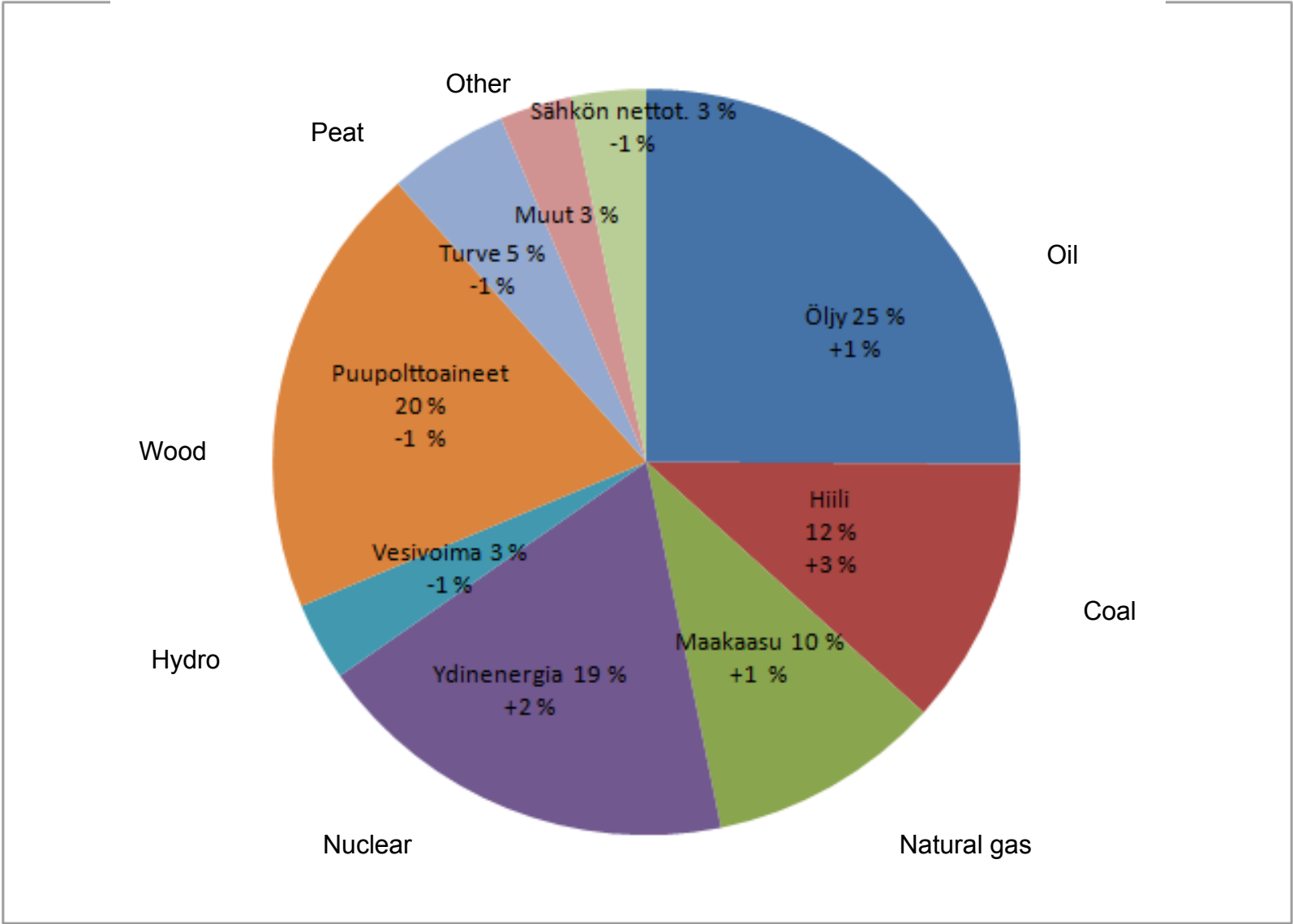
	ktoe	2005	2010	2020
Heating and cooling		13970	14010	15300
- RE		5530	5210	7270
		40 %		47 %
Electricity production		7530	7550	8740
- RE		2030	1950	2870
		27 %		33 %
Transportation		4220	4030	4080
- RE		0	220	560
		0 %		20 %
Gross final energy consumption		26260	25730	28170
- RE		7560	7380	10700

Share of Renewable Energy Sources of Total Energy Consumption in EU-27 in 2005 and Indicative Targets for 2010

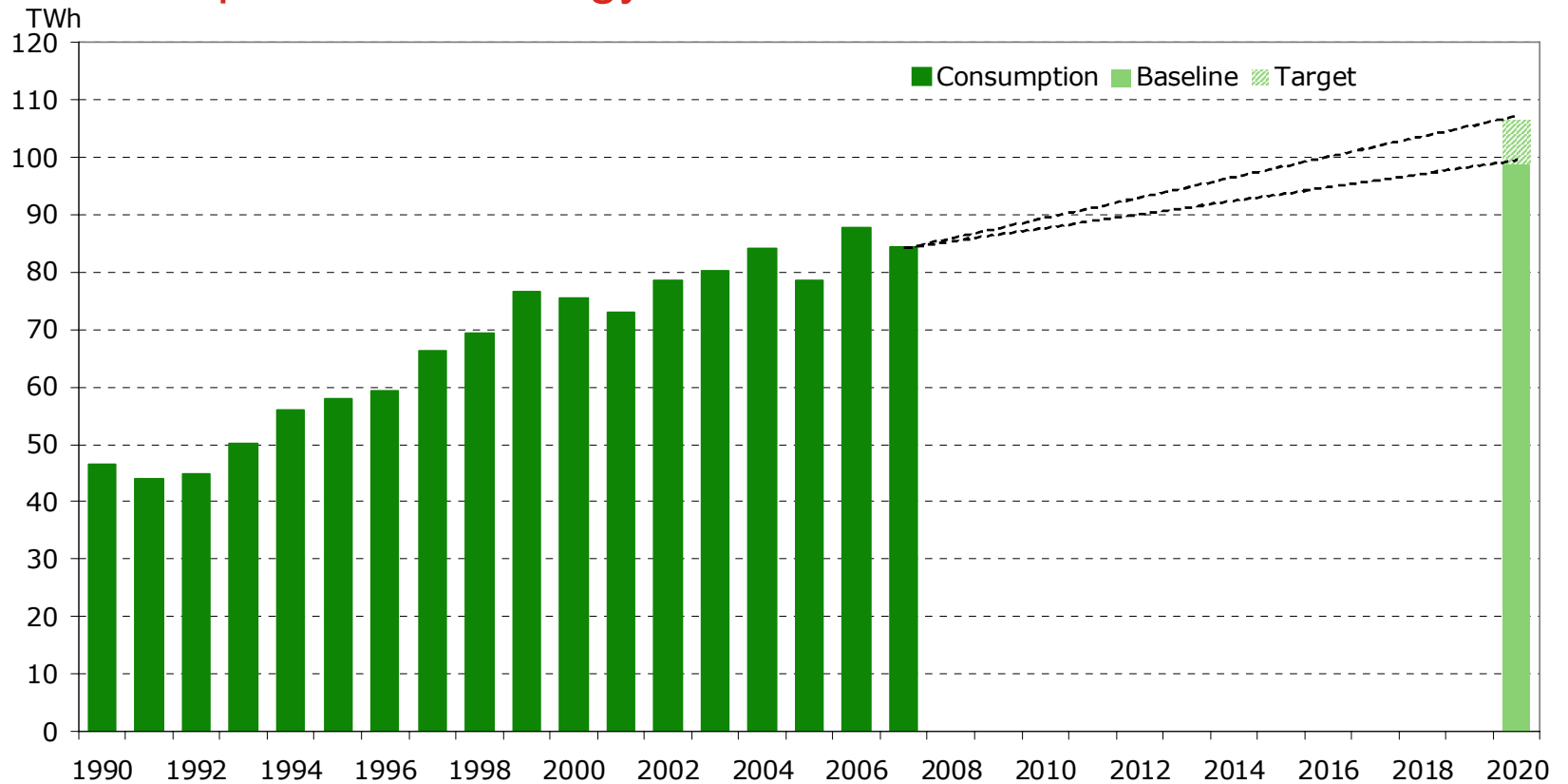


Source: Directive on the promotion of the use of energy from renewable sources, 2008/0016 (COD), Annex 1

Total energy consumption in Finland 2009



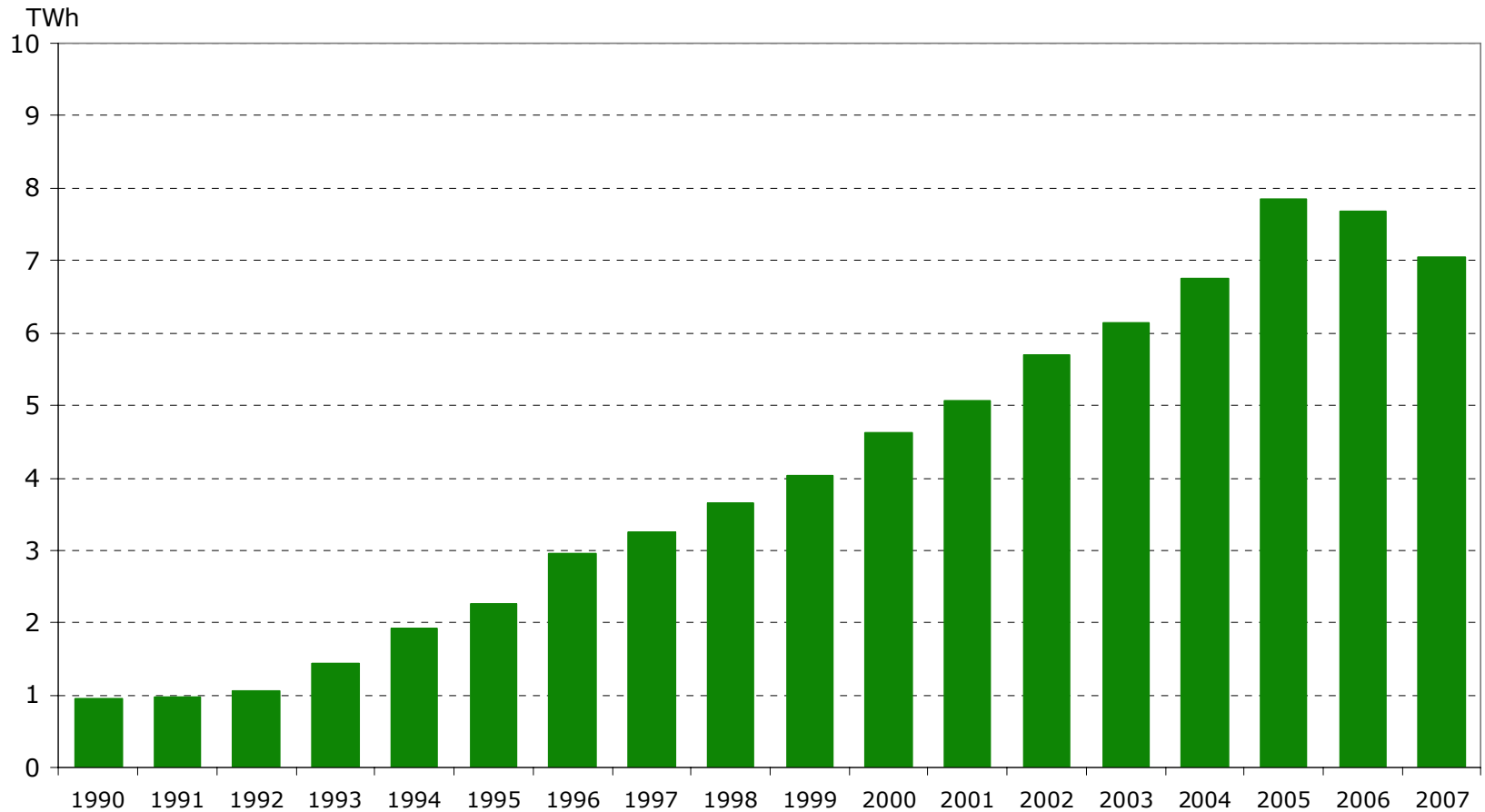
Total Consumption of Bioenergy in Finland



These statistics do not include peat.

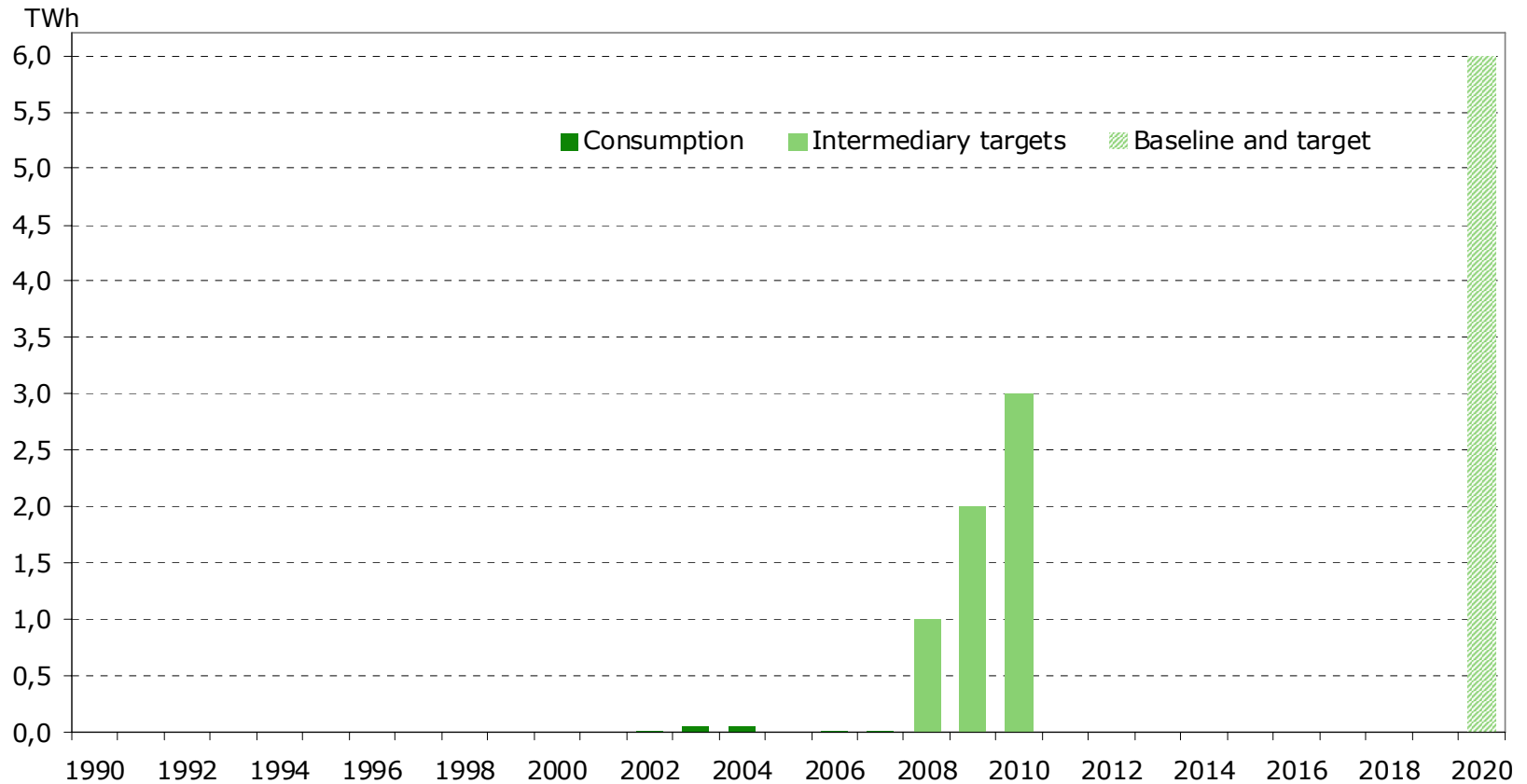
Sources: Statistics Finland, Energy statistics 1990-2007 (years 1990-2007)
Long-term climate and energy strategy, VNS 11/2008 (baseline and target)

Consumption of Bioenergy in District Heating



Source: Statistics Finland, Energy statistics 1990-2007

Consumption of Biofuels in the Transport Sector



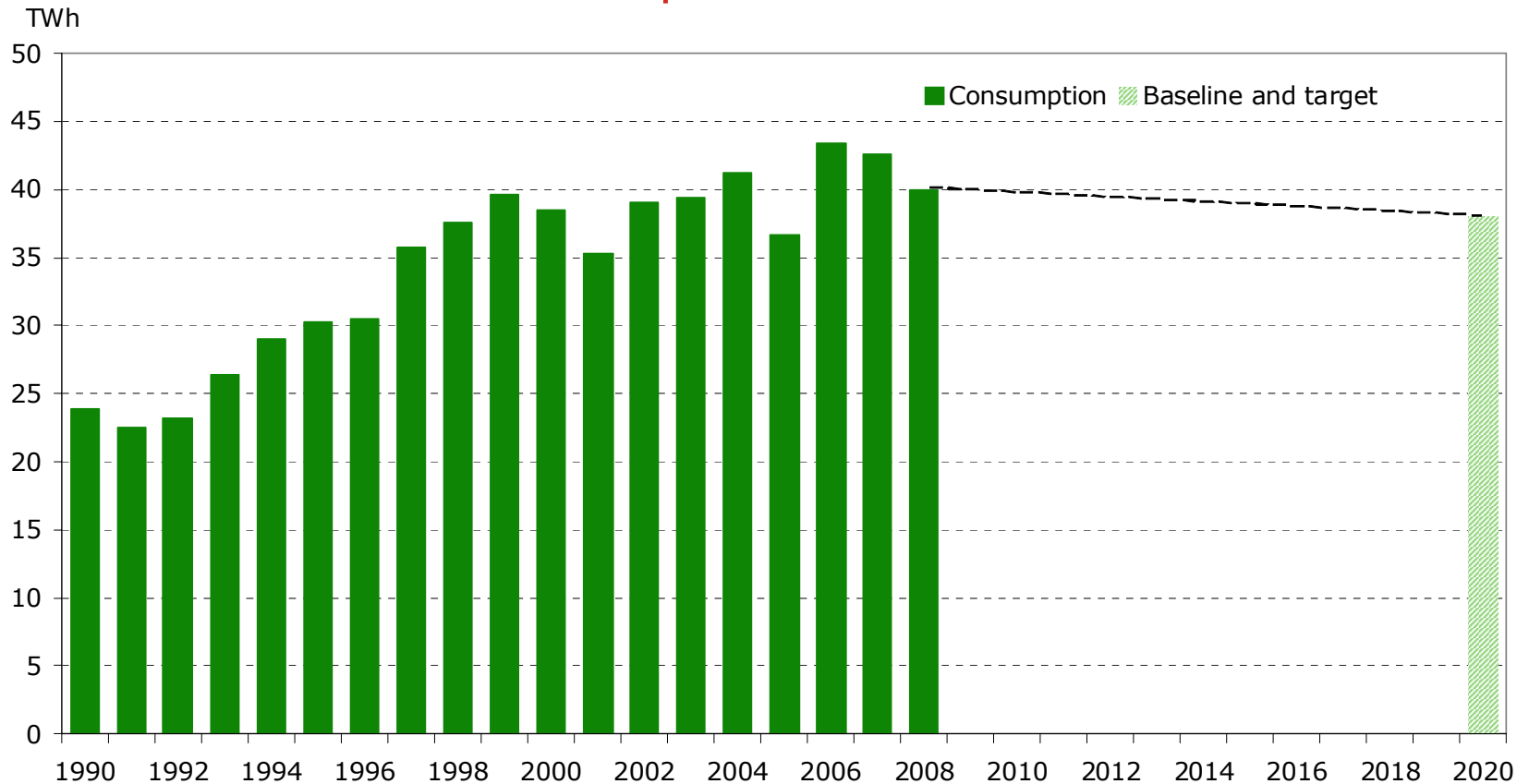
Statistics include liquid biofuels used in transportation, mobile machinery and heating. The targets are estimated based on Long-term climate and energy strategy.

Sources: Statistics Finland, Energy statistics 2000-2007 (years 2000-2007)
Long-term climate and energy strategy, VNS 11/2008 (baseline and targets)

Liquid biofuels

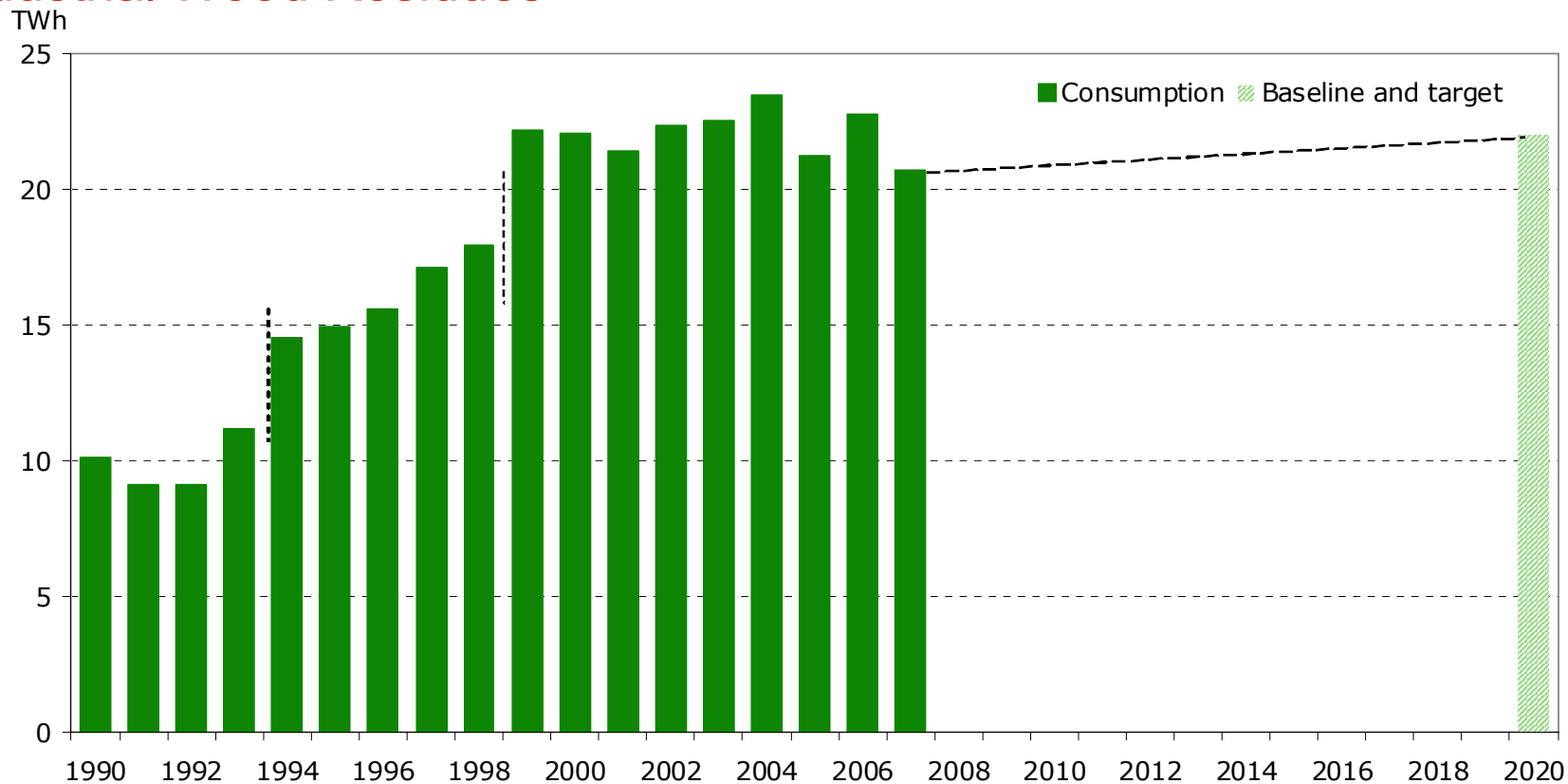
- Aim is 20 % (7 TWh) blending obligation in 2020
- Increased demand partly by new domestic supply: three new second generation biodiesel plants to be established in Finland
- In addition agrobiomass bioethanol production 120 000 - 150 000 tonnes /a
 - Estimated investments worth 120 M€
 - Sustainability criteria has to be met

Black and Other Concentrated Liquors



Sources: Statistics Finland, Energy statistics 1990-2007 (years 1990-2007)
Metla, Forest statistics press release (year 2008)
Long-term climate and energy strategy, VNS 11/2008 (baseline and target)

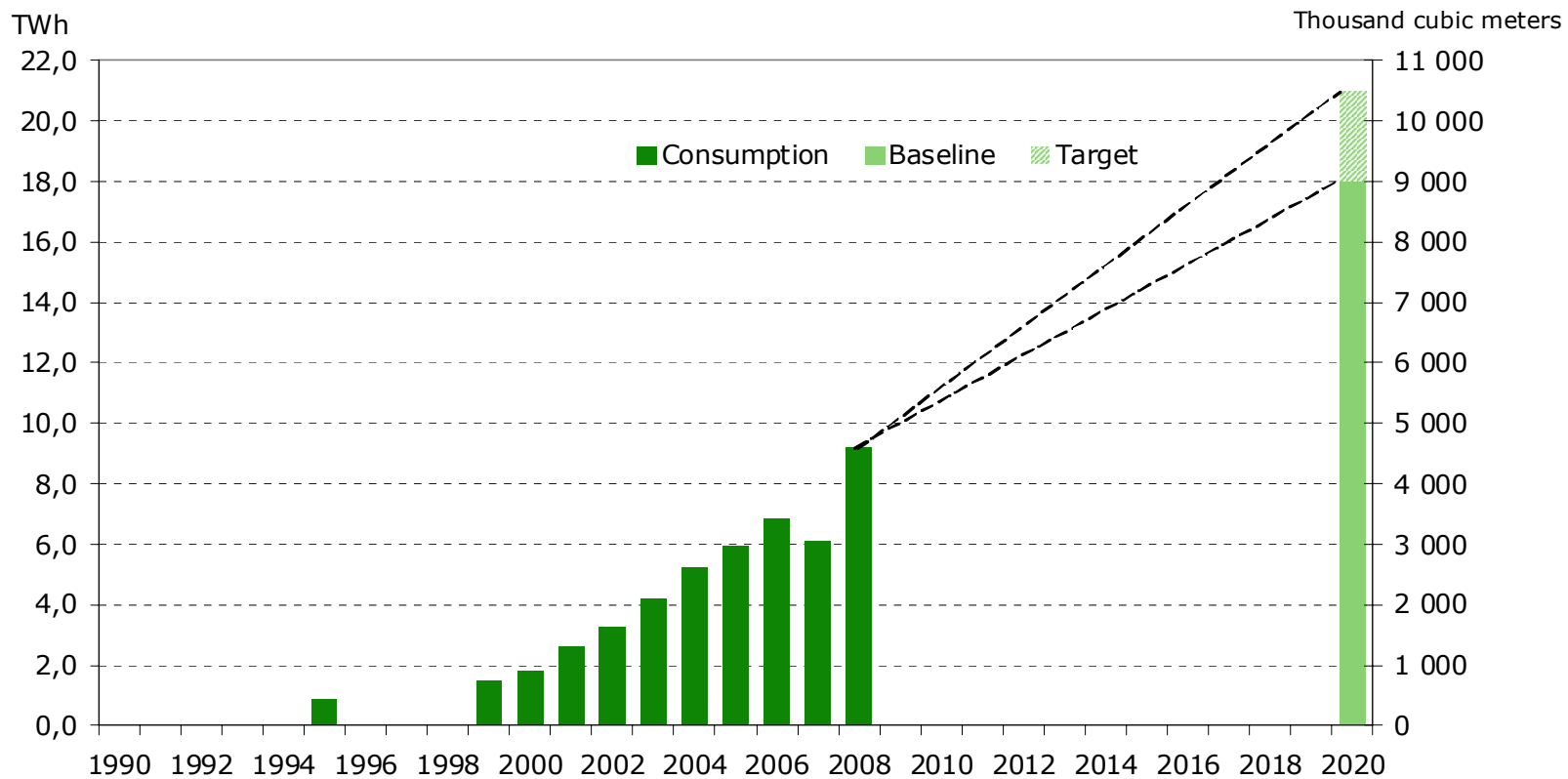
Industrial Wood Residues



1990-1998 includes forest chips. Data source changed in 1999. Based on a sample survey, 1994-1998 data has been corrected to correspond better with post-1999 data.

Sources: Statistics Finland, Energy statistics 1990-2007 (years 1990-2007)
Long-term climate and energy strategy, VNS 11/2008 (baseline and target)

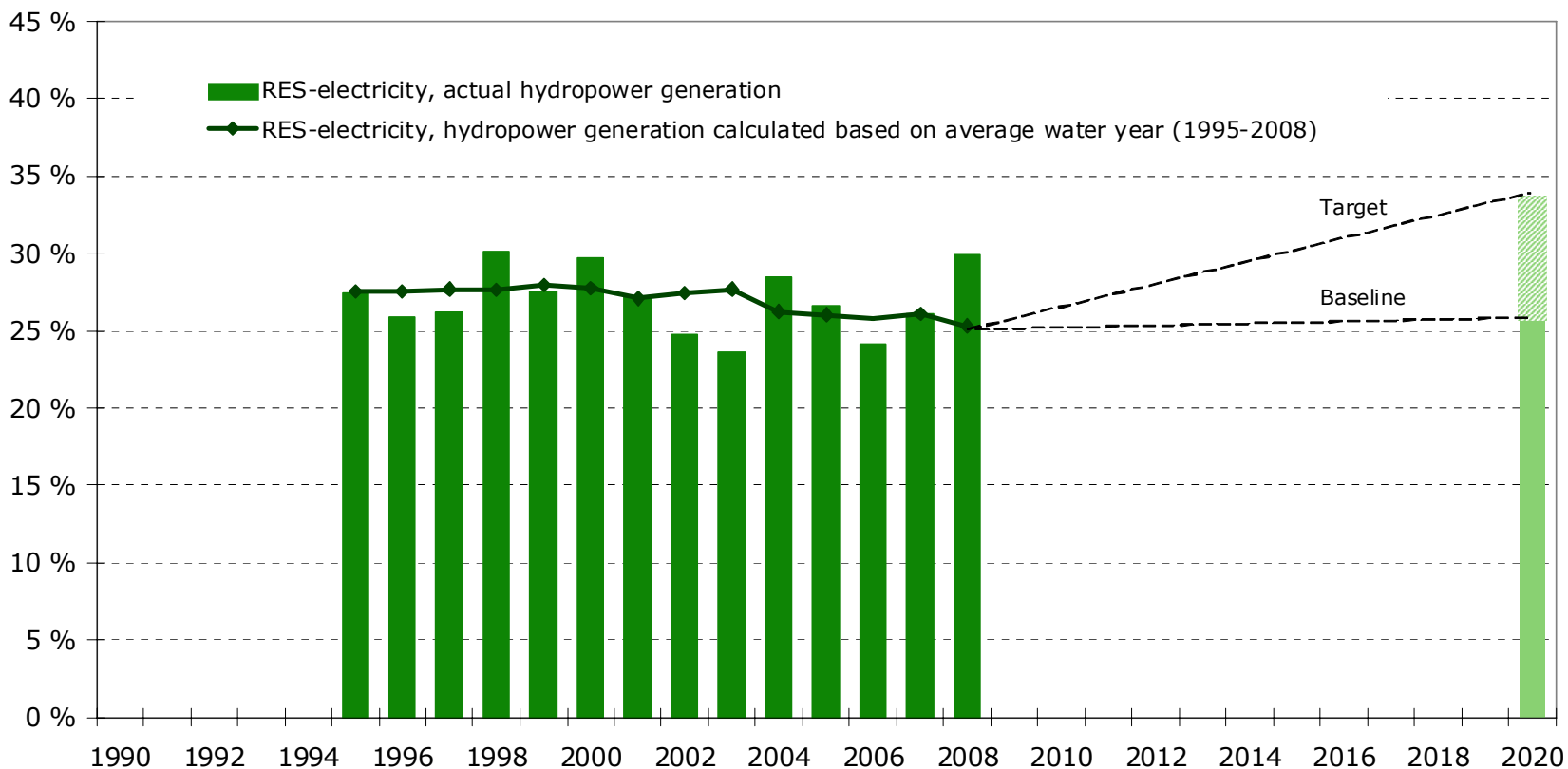
Forest Chips



In addition to this target, wood chips are planned to be used as raw material in biorefineries.

Sources: Statistics Finland, Energy statistics (years 1999-2007)
 Renewable Energy Action Plan 2003-2006, KTM 5/2003 (year 1995)
 Metla, Forest statistics press release (year 2008)
 Long-term climate and energy strategy, VNS 11/2008 (baseline and target)

Share of RES-Electricity of Total Electricity Consumption



Sources: Statistics Finland, Energy statistics 1995-2007 (years 1995-2007)
 Finnish energy industries (ET), Energy year 2008 - Electricity (year 2008)
 Long-term climate and energy strategy, VNS 11/2008 (baseline and target)

Flexibility mechanism

- Finland is not going to use the flexibility mechanism

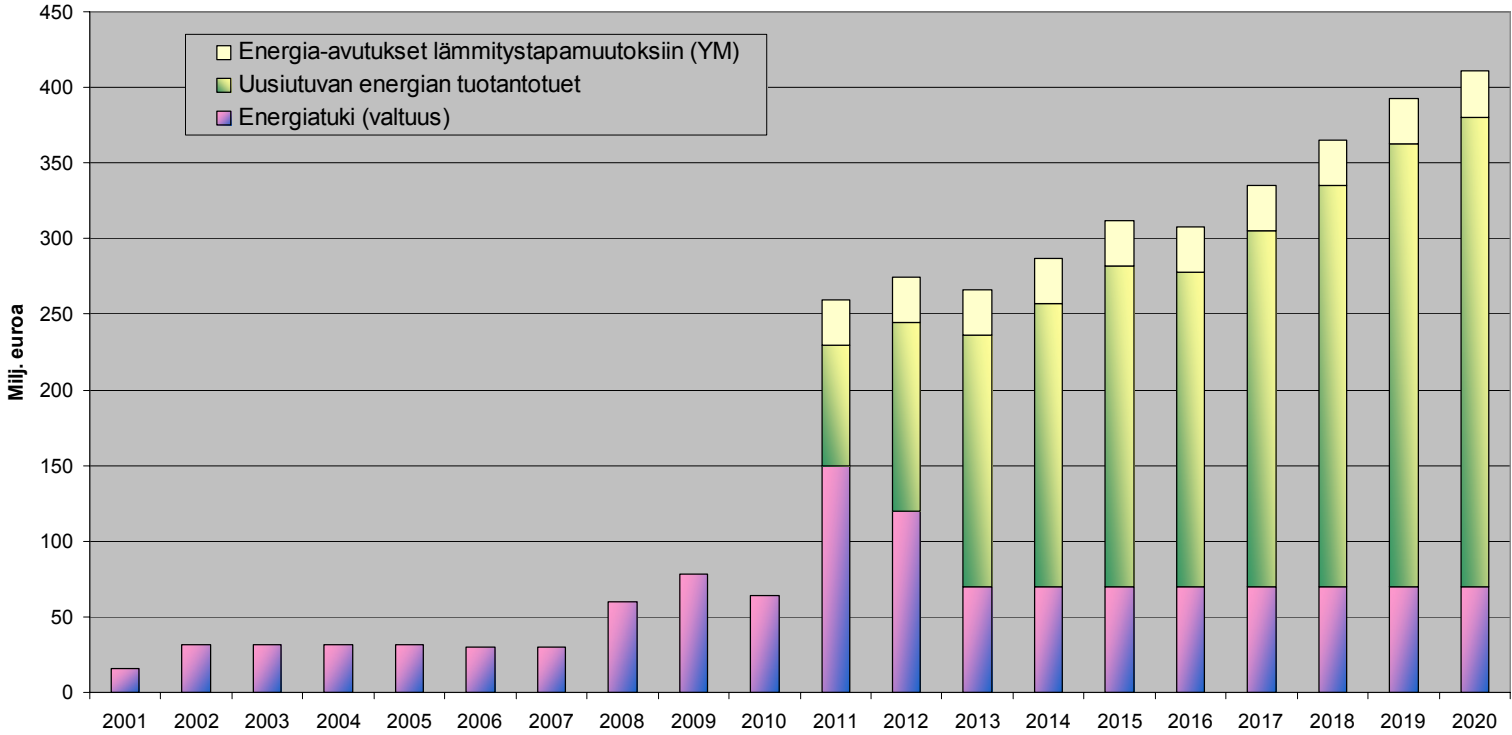
Support schemes

New subsidies for renewable energy

Several new subsidy schemes to promote renewables

- feed-in tariff (guaranteed price)
- small scale chp (< 20MW)
- harvesting of small diameter timber
- fixed subsidy for electricity production which not in the emission trading scheme
- subsidy for retrofitting old small scale (domestic) boilers to RE
- Replacement of coal by biomass (cofiring) in big coal plants on coast line

Energy subsidy and RE production subsidies 2001-2020



RE production subsidy year 2020:

- Wind and biogas feed-in tariff 200 milj. euro
- Small diameter wood 36 milj. euro
- Flexible electricity production 22 milj. euro
- Small scale CHP feed-in 36 milj. euro
- Fixed subsidy for small-sc. electricity 4,5 milj. euro
- Heating system change 30,0 milj. euro

Total about 330 milj. euro

TEM 16.9.2010

Feed-in tariff (guaranteed price)

- Support for 12 years
- Subsidy is difference between guaranteed price and the 3 month market price
- Guaranteed price is 83,5 €/MWh
 - For wind power 105,3 €/MWh till the end of 2015 (max 3 years per wind mill)
 - Heat premium
 - Biogas plant 50 €/MWh
 - Small scale wood CHP max 750 000 € for 4 years

Sustainable bioenergy production

Q&A

- *How does your government transpose and implement the **binding sustainability criteria for biofuels and bioliquids** contained in the Renewable Energy Directive (RED)?*
 - Sustainability criteria law
 - Forest based biomass: PEFC certification system
 - Agrobiomass and imported biomass: not decided (customs)
 - Certification for biomass grown on the Finnish soil.
- *Does your government intend to introduce any **sustainability requirements for solid/gaseous biomass for electricity and/or heating and cooling**, taking into account the recent recommendations by the EU*
 - Not considered in Finland

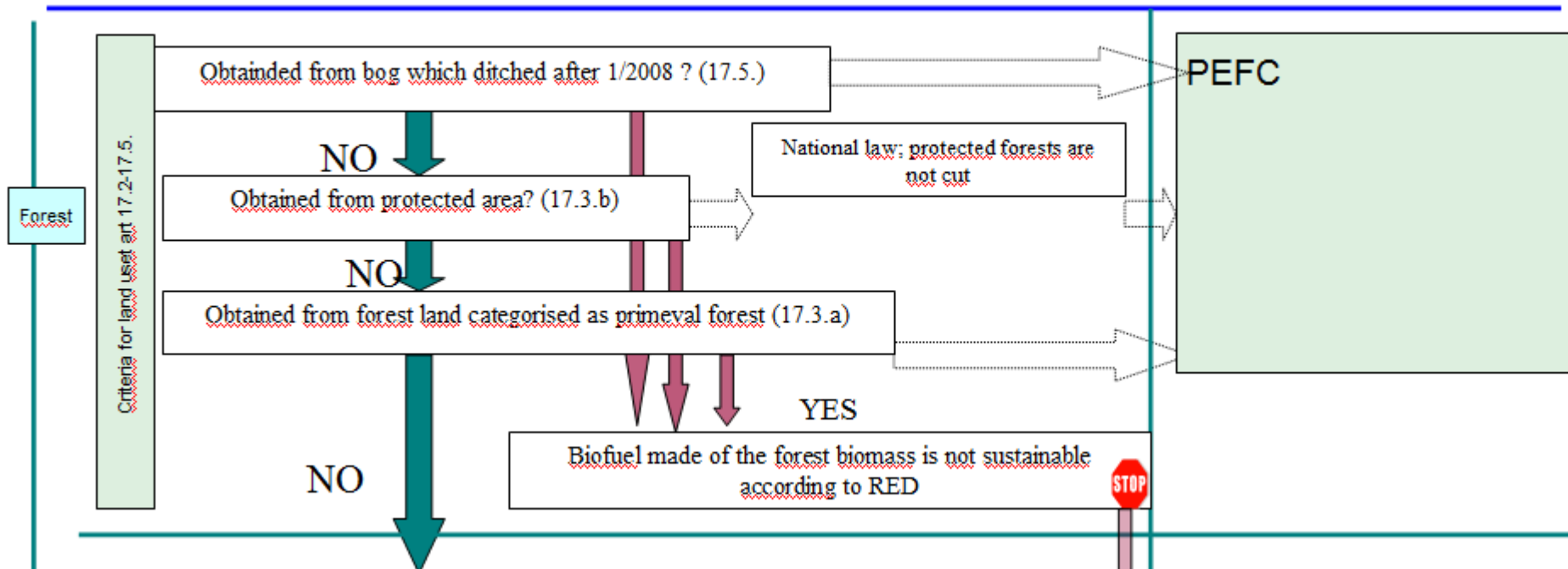
Q&A

- *To what extent do the support schemes take into account the EU COM recommendations to differentiate in favour of installations that achieve high energy conversion efficiencies, such as high efficiency cogeneration plants?*
 - subsidies higher
 - Biogas plants 50 €/MWh extra
 - Small scale CHP get feed-in tariff

Verification chain

VERIFICATION CHAIN – FOREST RESIDUES - FINLAND

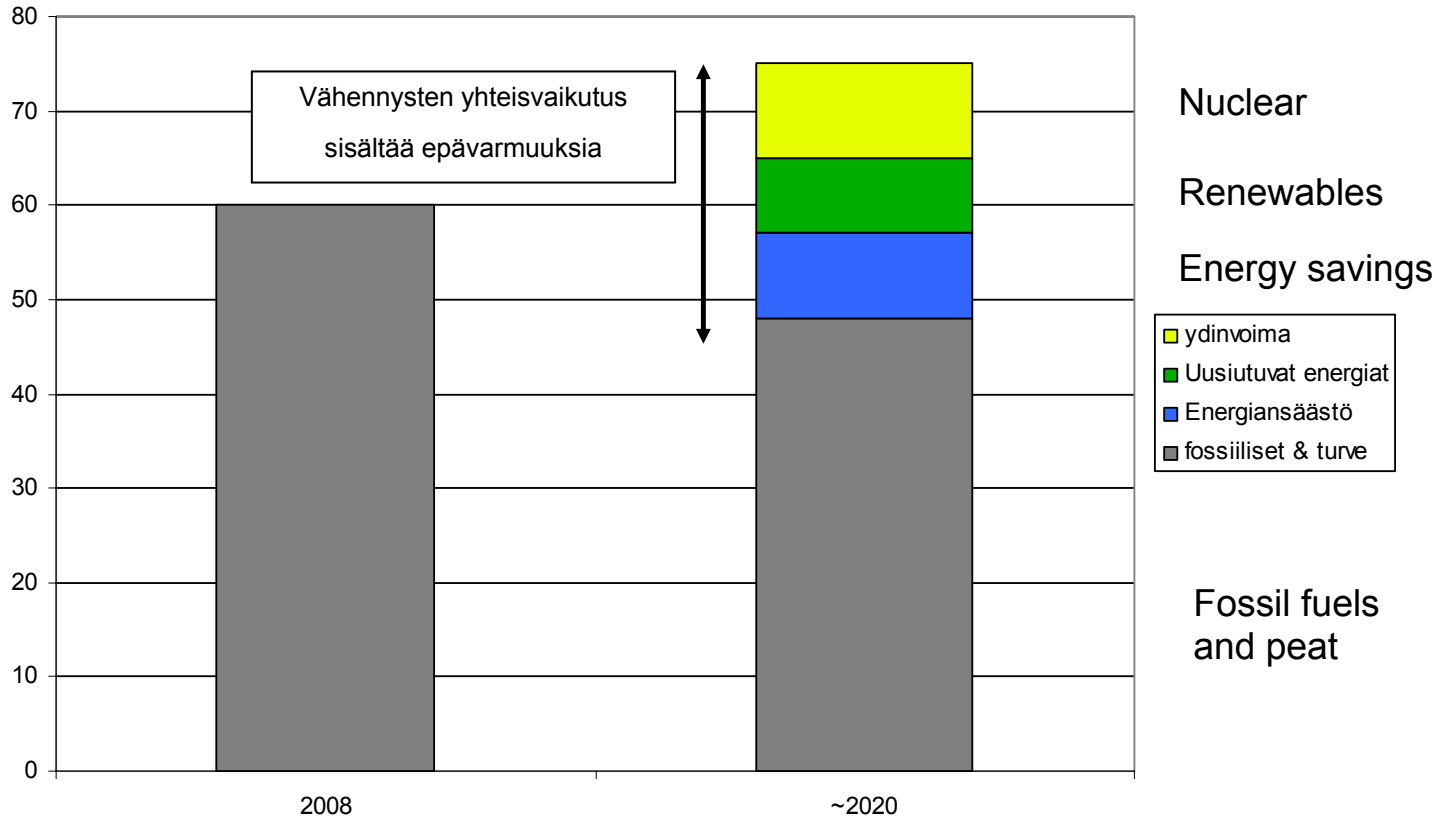
VERIFICATION



CO2-emission reductions

Energian tuotannon päästöt 2008 ja vähenemä vuoteen 2020 (milj. co2 tonnia)

M CO2



THANK YOU

More information
www.motiva.fi/en