Industrial CHP with Biomass

- economics and legal framework -

Nuremberg July 12th 2016

Dipl.-Ing. Volkmar Schaefer
eta energy-consulting
D- Pfaffenhofen
Tel: +49 (84 41) 49 46 0

iSEneC 2016
INTEGRATION OF SUSTAINABLE ENERGY CONFERENCE

eta energy-consulting
profile

- The eta energy-consulting is a neutral ***full-service provider*** in the energy sector.
- Our team consists of engineers who are ***experts*** in different fields of energy technology.

Energy Saving

- Our ***energy concepts*** lead to suitable solutions and lasting cost reduction. We optimize existing and planned supply structures concerning electricity, heat, chill, compressed-air …

Energy Production

- We realize economical ***power plants*** and on-site generation by proper design of appropriate technology with minimal operating costs.
- We design detailed concepts for sustainable heating sales, acquire heat customers and plan ***district heating grids***.

Energy Procurement

- For ***purchasing*** grid-bound energy, we realize marginal prices, high savings, rebates and refunds of energy taxes.

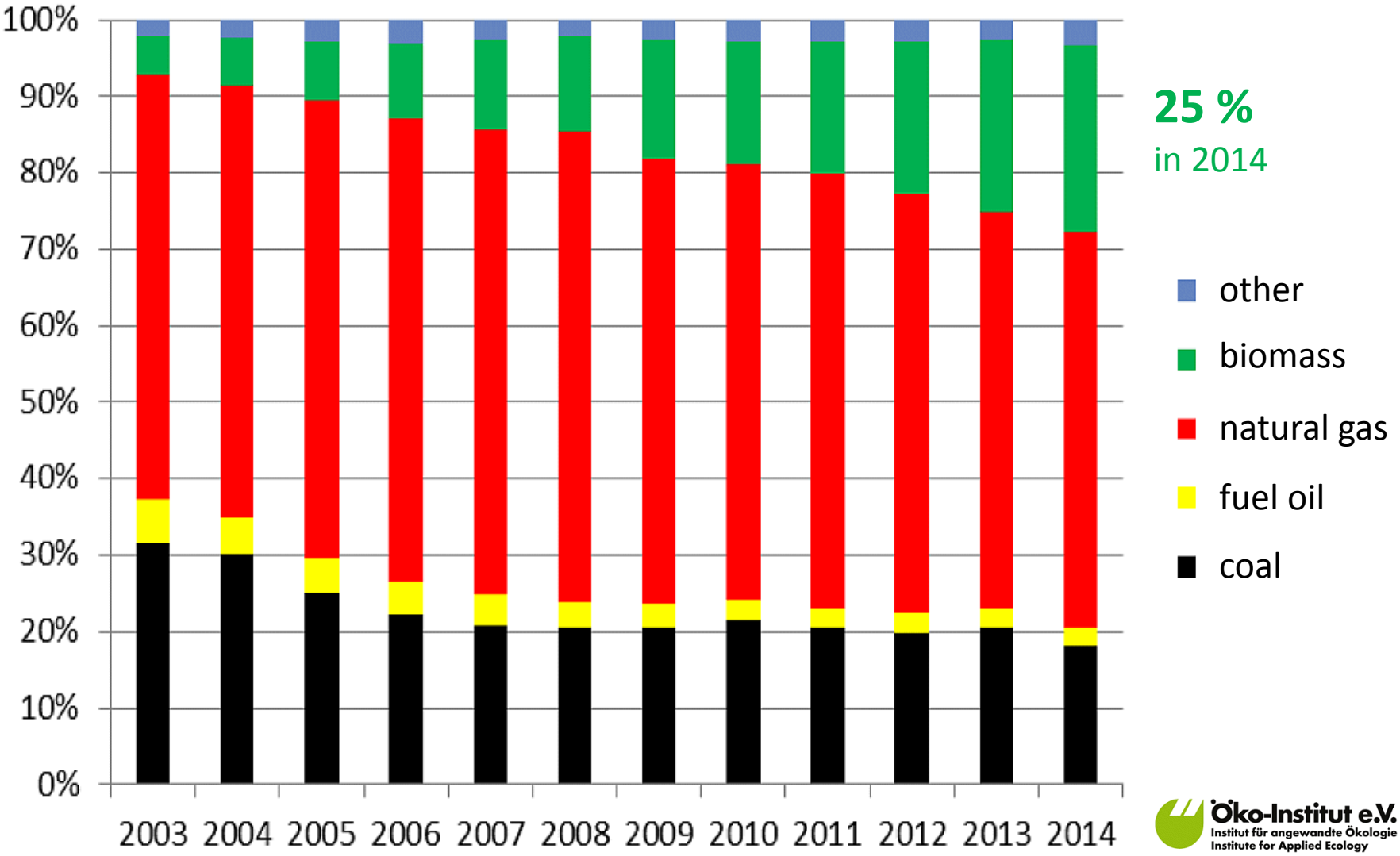
eta Energieberatung GbR
Diplomingenieure Florian Ilmberger
und Volkmar Schaefer
Loewenstrasse 11
D - 85276 Pfaffenhofen a. d. Ilm

Biomass-CHP Ernsthofen

23 MW thermal input for 10 MW_{th} und 5 MW_{el}

share of energy sources

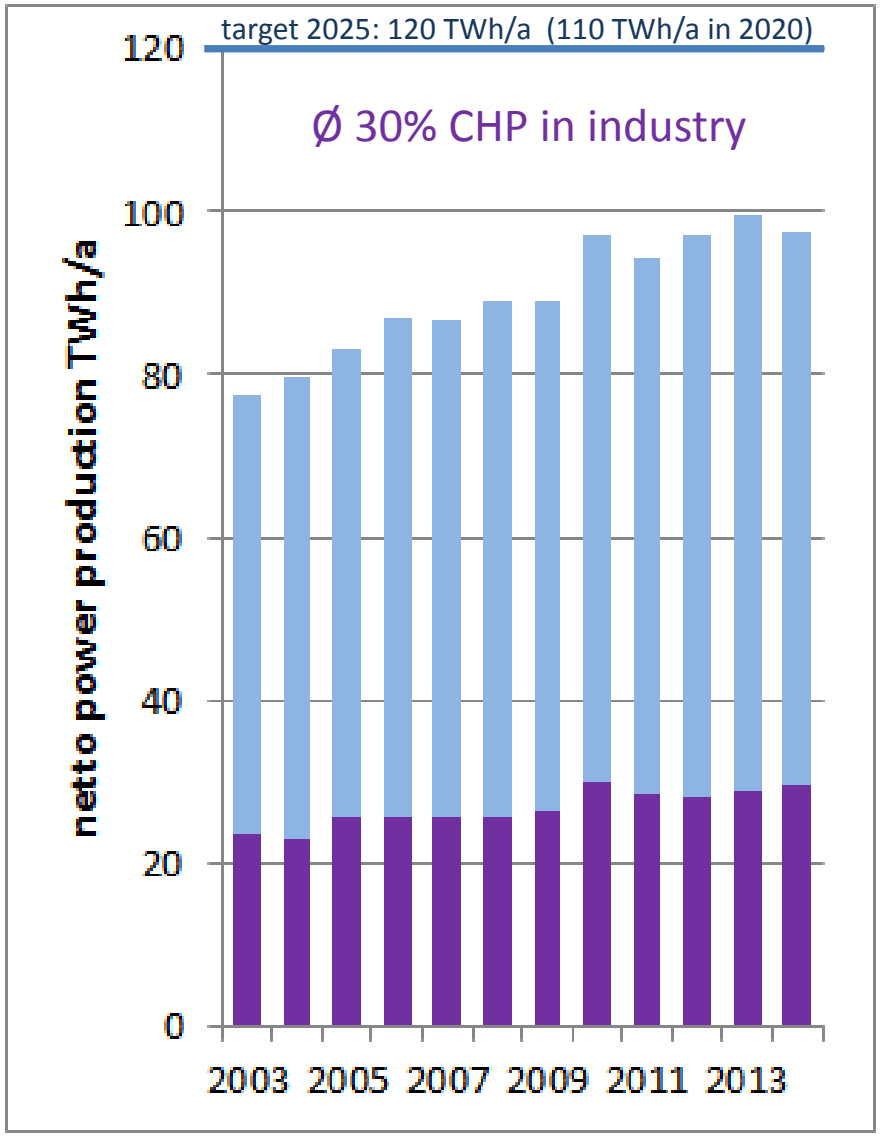
in the netto power production by CHP in Germany

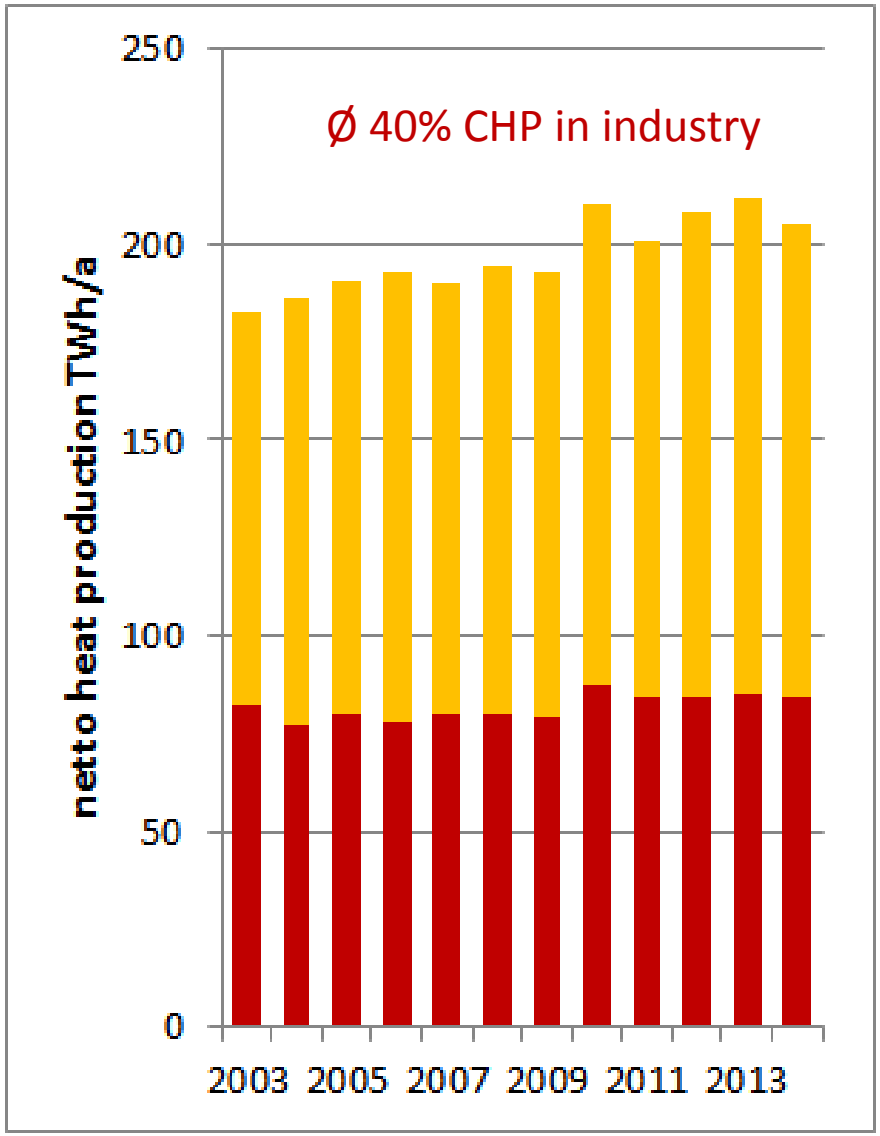


Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

CHP production in Germany

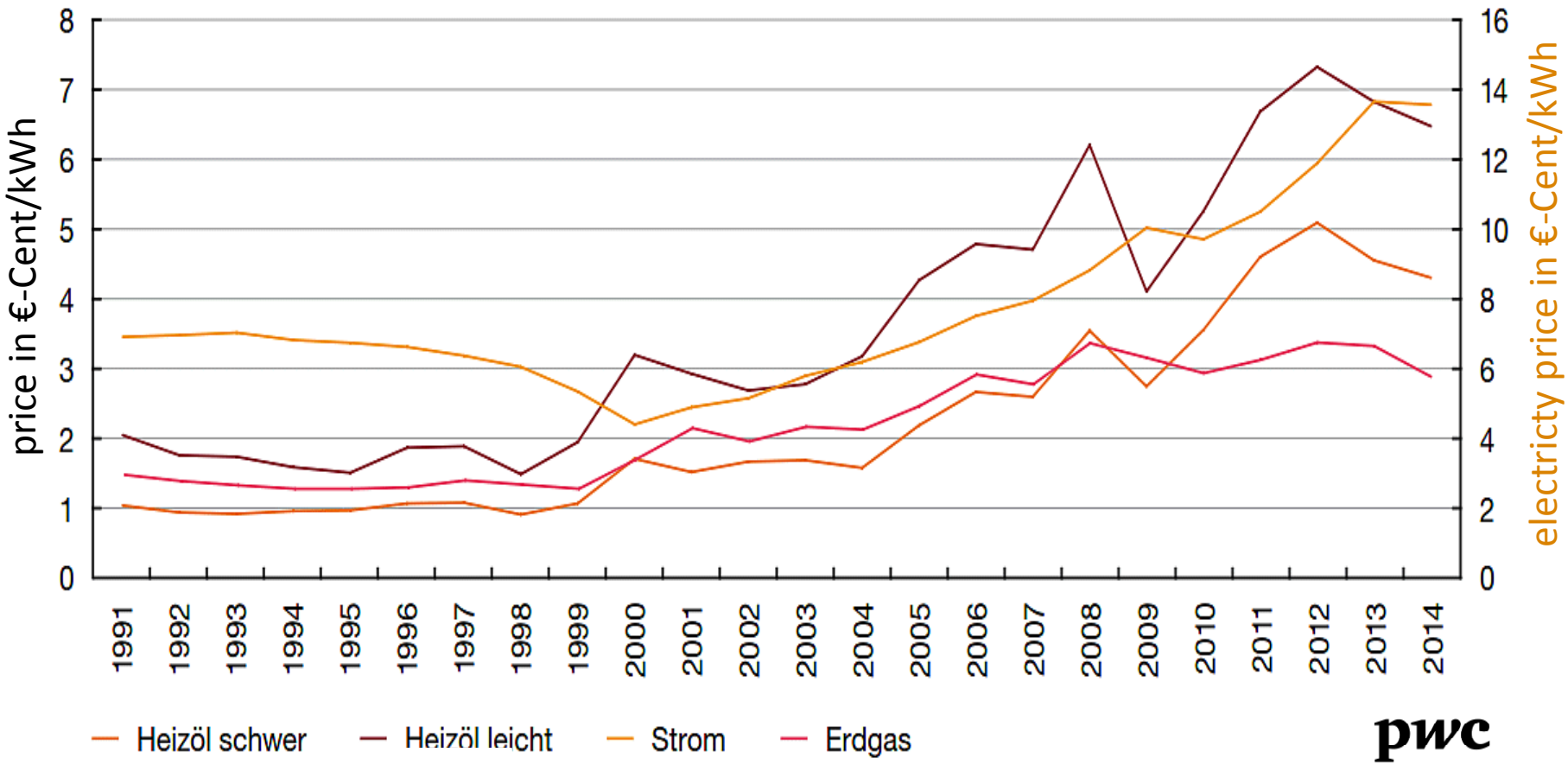
power and heat production 2003 - 2014





trend of energy prices
in German industry

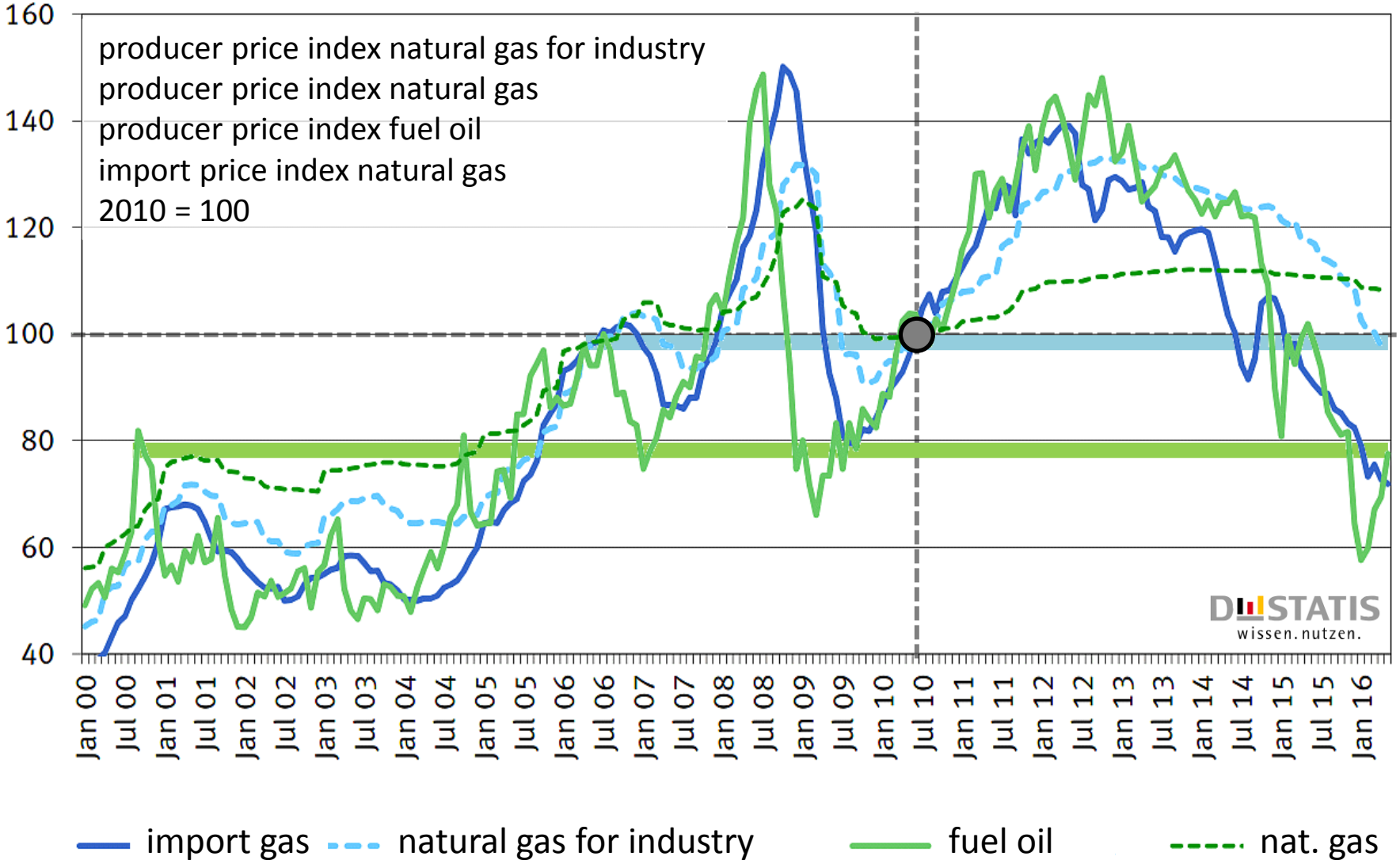
exclusive of VAT



heavy fuel oil fuel oil power natural gas

trend of energy prices

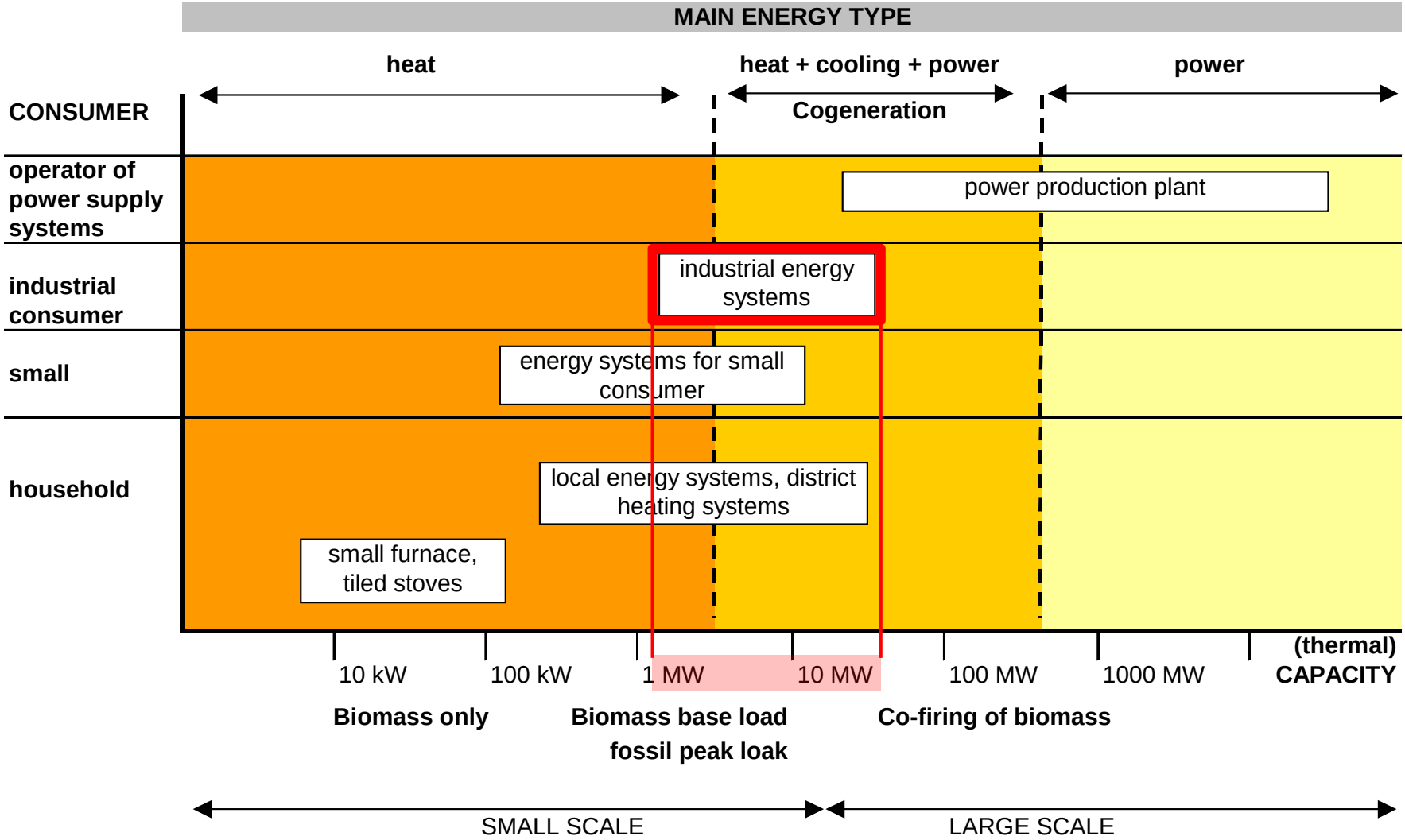
price index 2010 = 100



import gas — natural gas for industry — fuel oil — nat. gas

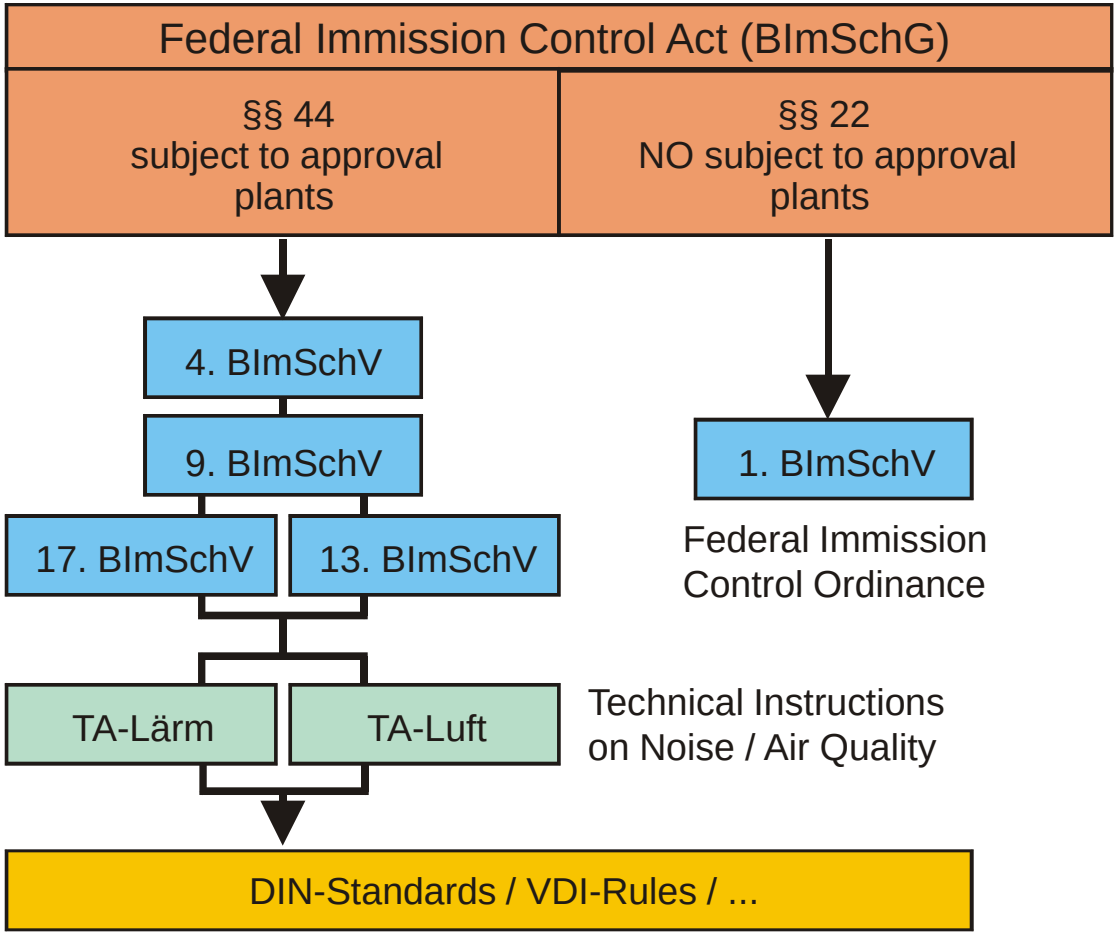
installed capacity and usage

from „small scale" to „large scale"



Legal Requirements

Laws - Acts - Regulations - Rules - Standards



solid and liquid biomass fuels

classification according to the legal approval

Approval procedure acc. to 4. BImSchV

- not subject to approval (1. BImSchV)
- simplified procedure (§ 18 BImSchG)
- formal procedure (§ 10 BImSchG)
- usage forbidden

Testing acc. to UVPG

SVP = Preliminary location-based testing

AVP = General preliminary testing

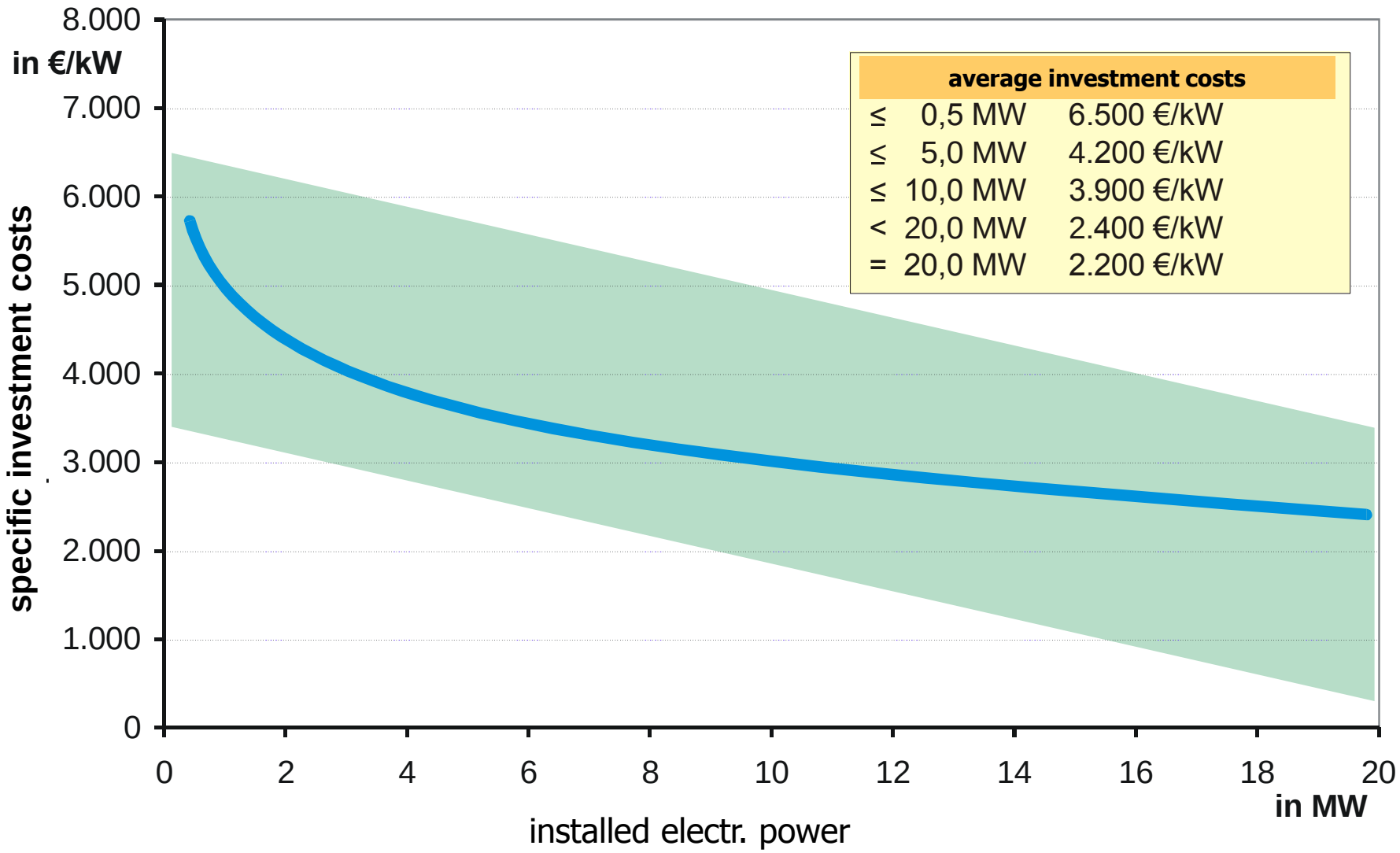
UVP = Environmental impact assesment

Fuel	type of plant	Emissions limitation / UVPG classification						
Natural wood incl. Holz inkl. Pellets	1.2	1. BImSchV				TA Luft / SVP		13. / AVP
Natural vegetable oils and PME	1.2, 1.4					TA Luft / SVP		13. / AVP
Straw or similar herbal substances	1.3		1. BImSchV		TA-Luft / SVP	TA Luft / AVP		13. / AVP
Other solid and liquid fuels	1.3, 1.4				TA-Luft / SVP	TA Luft / AVP		13. / AVP
Wood, painted, lacquered, coated, plywood, chipboard, fiberboard or other glued wood as well as its residues without halogenated organic coatings and wood preservers	8.2			1. BImSchV (only in establishments within the wood processing industry)		TA Luft / SVP		13. BImSchV / UVP
Wood or processed wood panels with halogenated organic coatings or with wood preservers	8.1 a					17. BImschV / UVP		
	0.01		0.015	0.05	0.1	1	10	50
	Thermal input in MW							

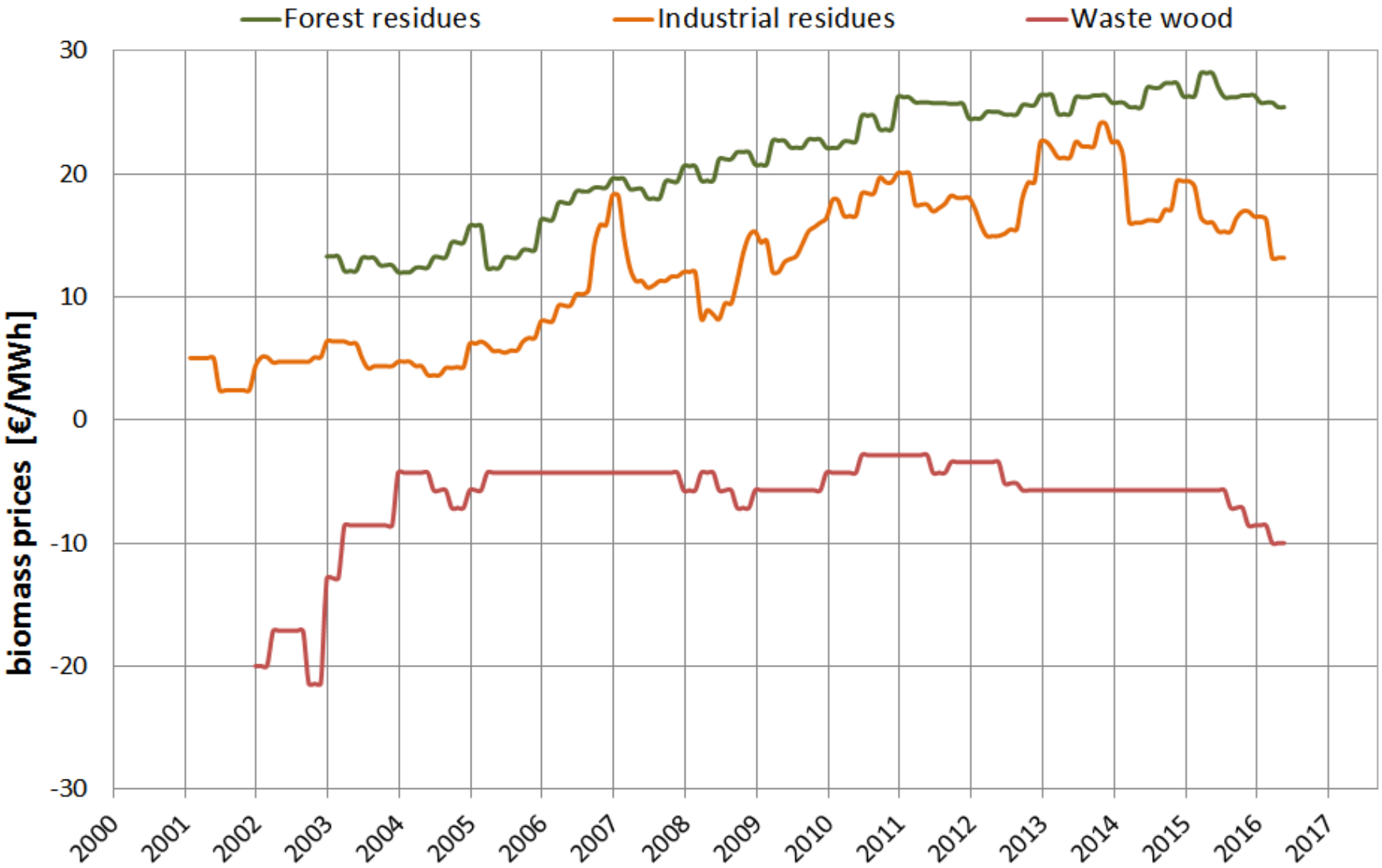
Source: ZAE Bayern, Abt.1; Dr. Fischer

Biomass-CHP

specific investment costs



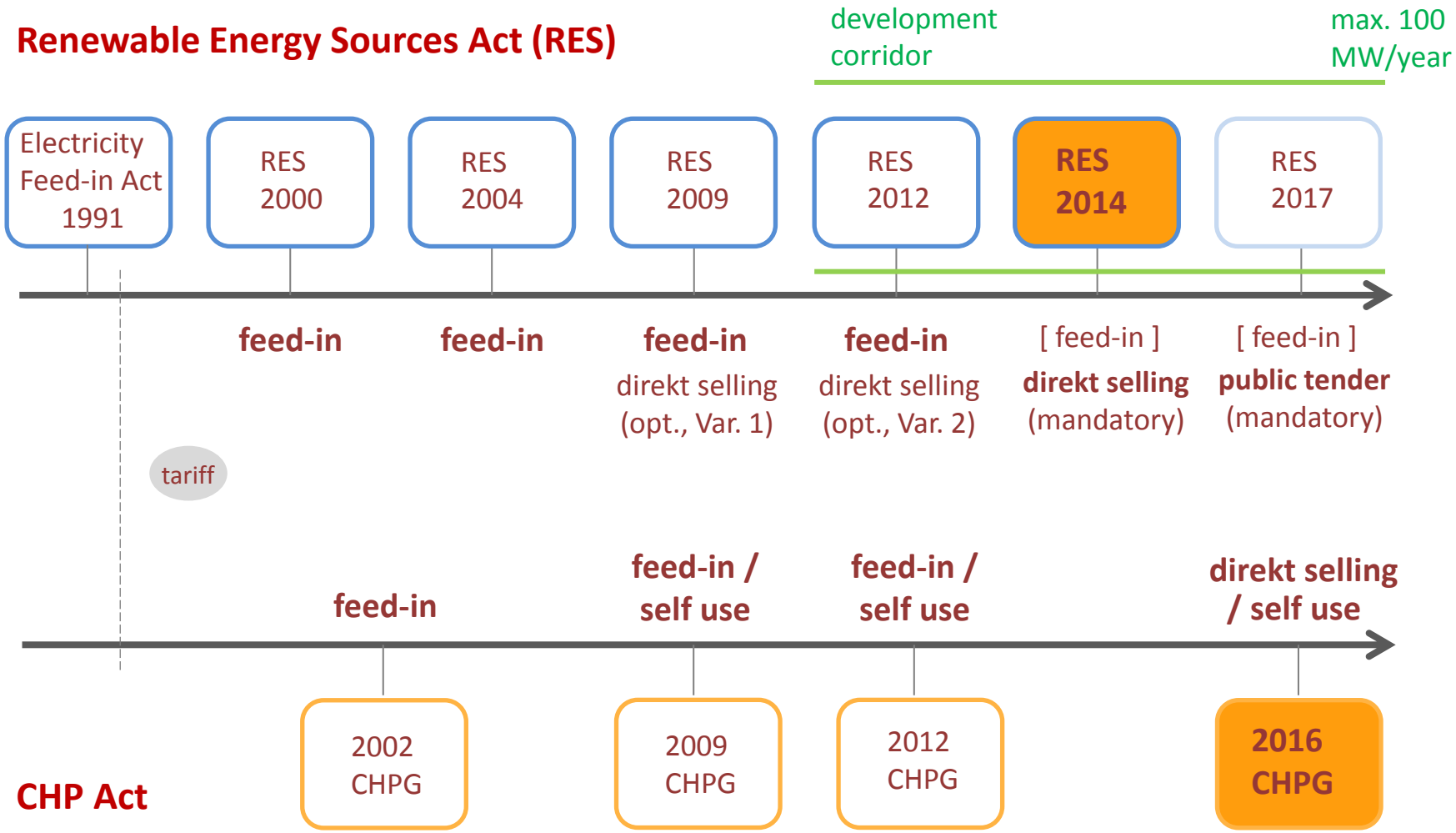
biomass fuels
price trend in Germany



iSEneC 2016

subsidies by law

Renewable Energy Sources Act (RES) or CHP Act



CHPG = Act on Combined Heat and Power Generation

iSEneC 2016

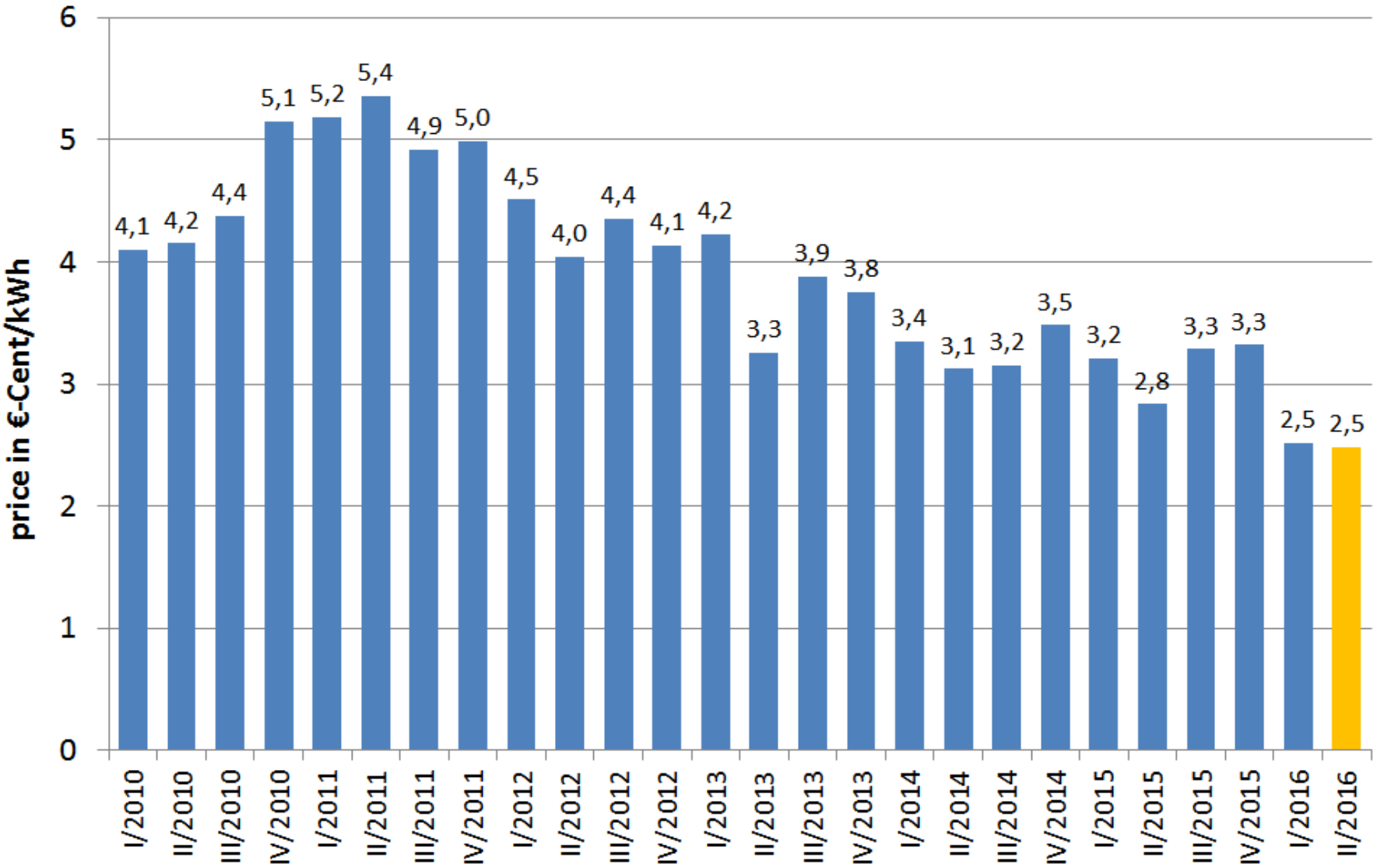
CHP Act 2016

sponsorship according to categories

A	Eligibility Period by full load usage (in hours)	60000			30000	
B	CHP Electricity to **public grid**	8	6	5	4,4	3,1
C	CHP Electricity for **own usage**	4	3			
D	CHP Electricity from **IPP** (no public grid)	4	3	2	1,5	1
E	CHP Electricity in energy-intensive **industries**	5,41	4		2,4	1,8
E	system within the Greenhouse Gas Emission Trading Act (TEHG)	+ 0,3				
G	gas-fired CHP-Plants replacing coal-fired	+ 0,6				

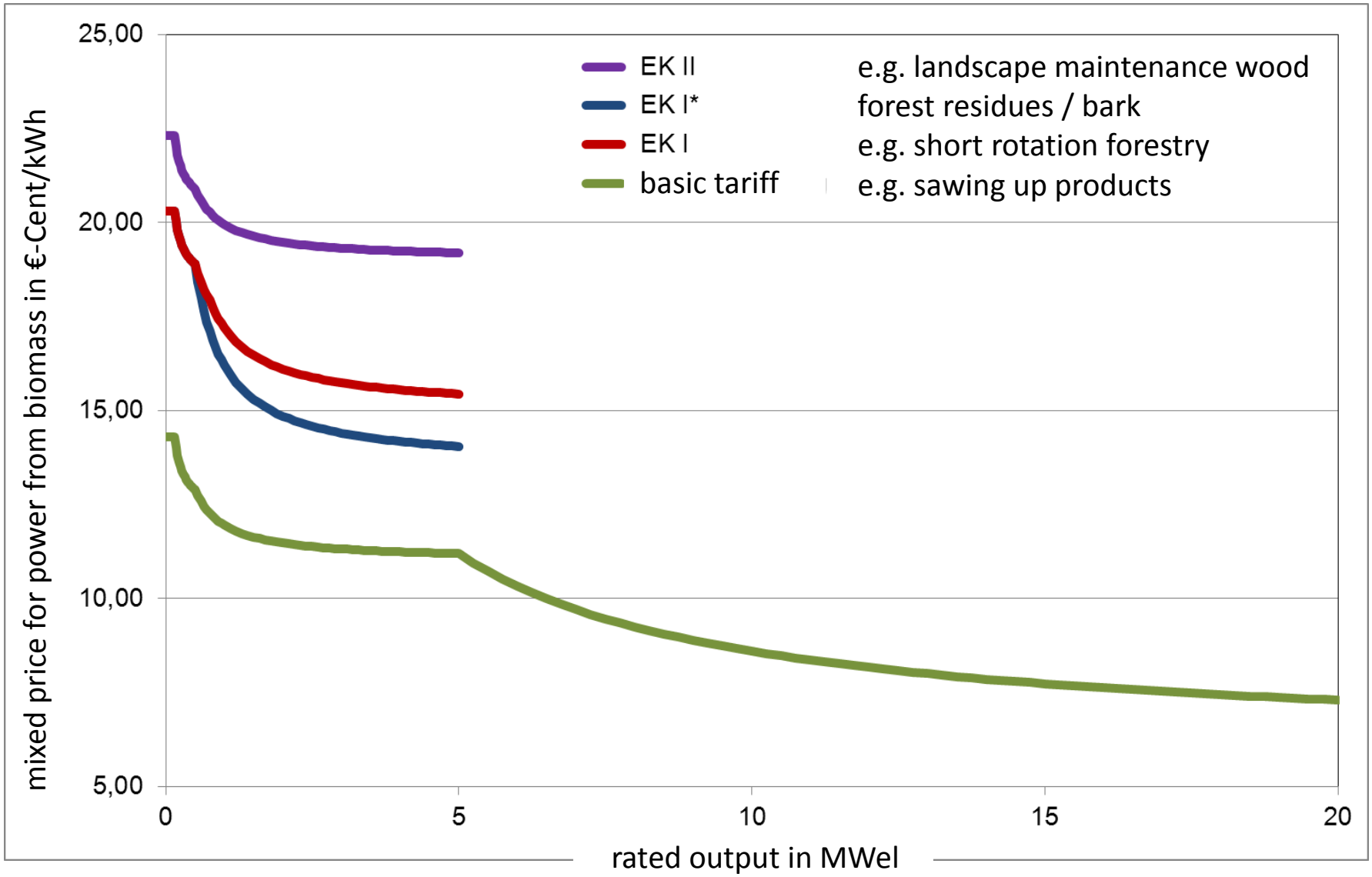
plant size in kW_{el} 50 100 250 2000

average quarterly price
on the energy exchange

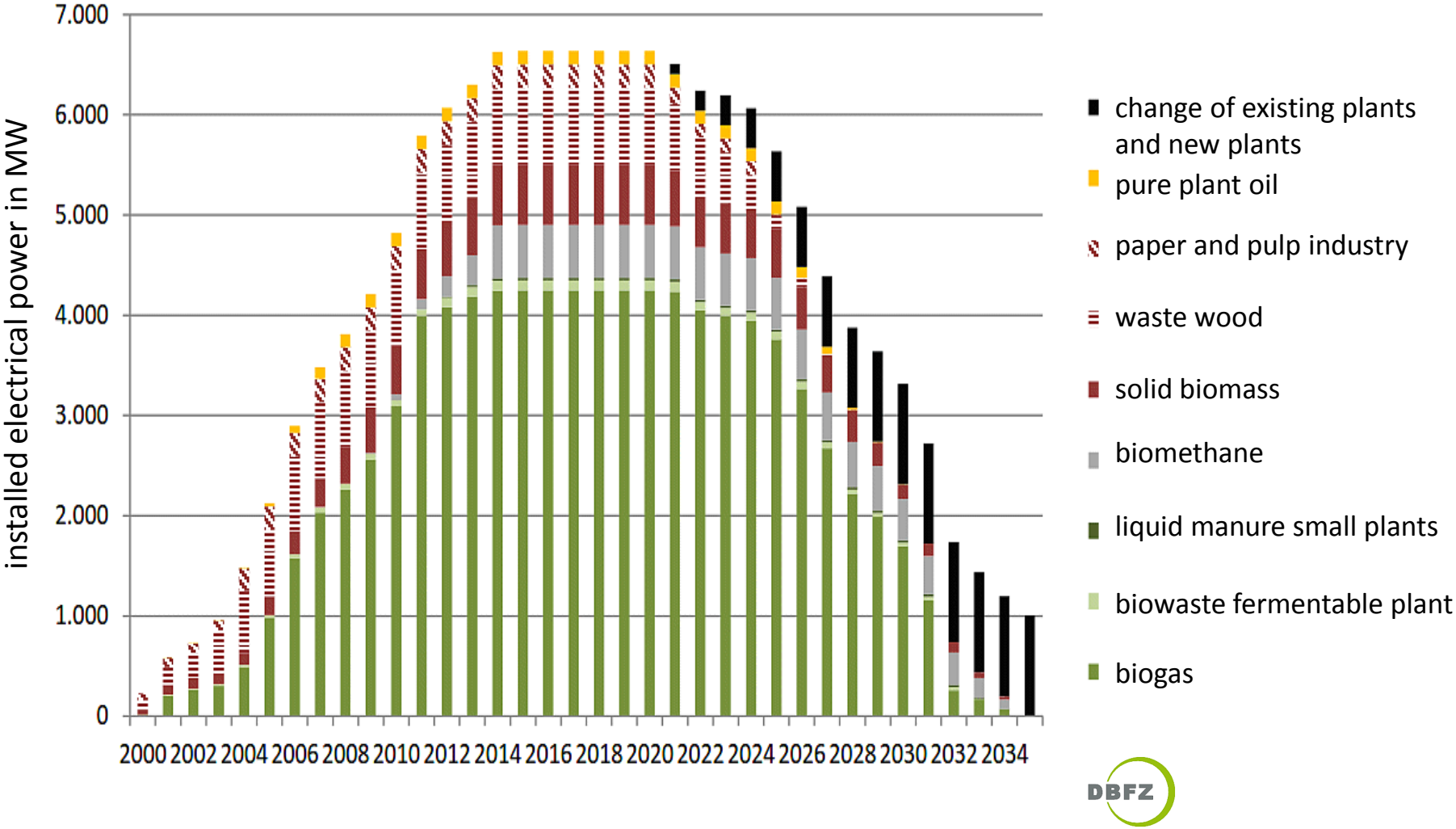


feedin-tariff by EEG 2012

share scheme up to 20 MW_{el}



development of installed plants
with follow-up support for existing installations



cutting energy costs with concept

www.eta-energyconsulting.net