

Schädliche Förderungen – Verlorene Zeit und Mittel

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„If governments do not facilitate the investment, I don't think nuclear will fly“

Fatih Birol, Chief Economist

*OECD International Energy Agency
in: The Economist, 9 November 2006*

Die Hausaufgaben Europas



- In EU 27 und über die kommenden Jahrzehnte müssen etwa 400 GW, über 50%, der installierten Stromerzeugungskapazität aus dem Produktionsbereich genommen werden.
- Die Mehrzahl dieser alten Parks sind atom- oder kohlebetrieben.
- Wie diese ersetzt werden ist entscheidend für Europas künftige Klima- und Energiepolitik
- Strikter Vorrang für Erneuerbare Energien und drastische Energieeffizienz sind notwendig insbesondere im Verhältnis zur Diskussion um neue Atomkraftwerke, neue Kohlekraftwerke oder die Verlängerung ihrer Laufzeiten

Neues Management für Energie



- Strom wird künftig mehr abhängen von Sonne und Wind.
- Alle Energie die nicht von erneuerbaren Quellen kommt, wird künftig nur noch in Flexiblen Kraftwerken (Gas, GuD) und mit Pumpspeicherkraft zu nutzen sein
- Gemeinsam mit dem raschem Ausbau intelligenter Systeme mit Einsatz des Gebäude- und des Autosektors für Speicherung und Ausgleich, unterstützt durch Wasserkraft und Biomasse, Grossbatterien etc.

Neue Intelligenz

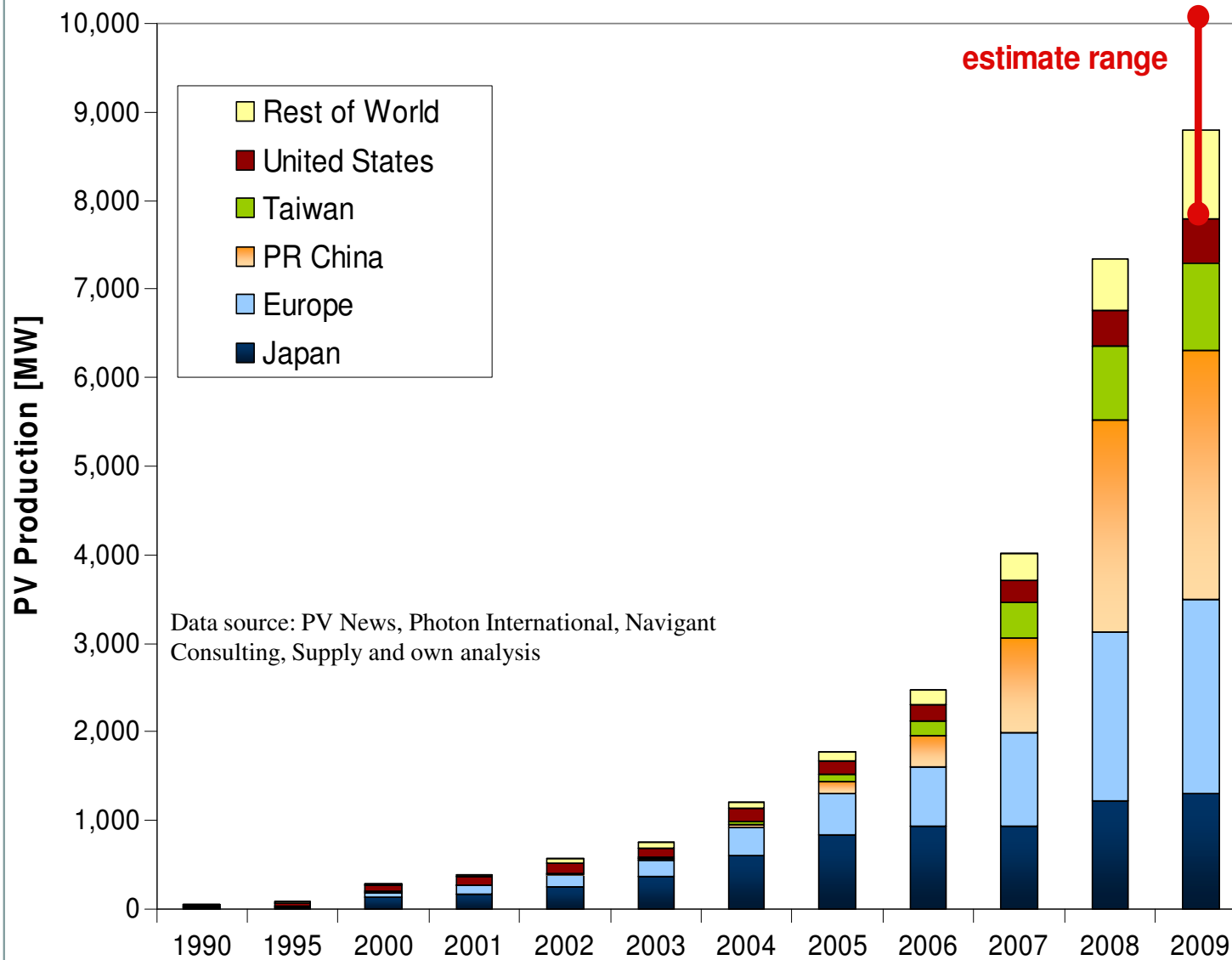


- Speicherkapazität ist der Schlüssel zum Erfolg
- Netzausbau und intelligente Netze sind notwendig, müssen aber der “decentralised distributed agenda” folgen
- “Dual use” als Speicherkraft (wie etwa über Autobatterien)

ABER:

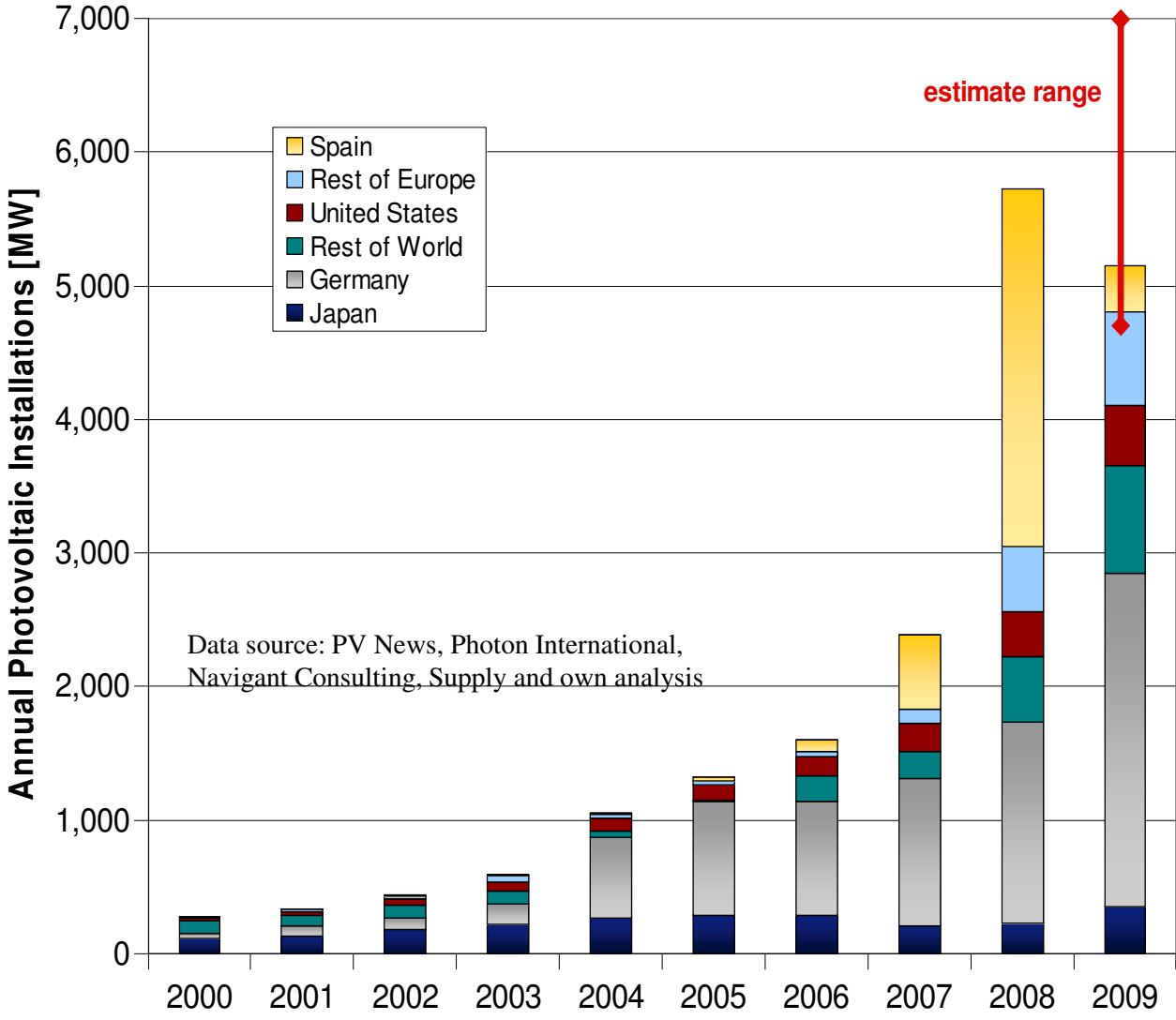
- Forschung ist nötig, um die derzeitigen Kosten zu senken:
- Wasserspeicher: 3-10 ct kWh
- Luftspeicher: 38 ct kWh
- Batterien/ E-Mobilität: 20-40 ct kWh

PV Cell/Module Production

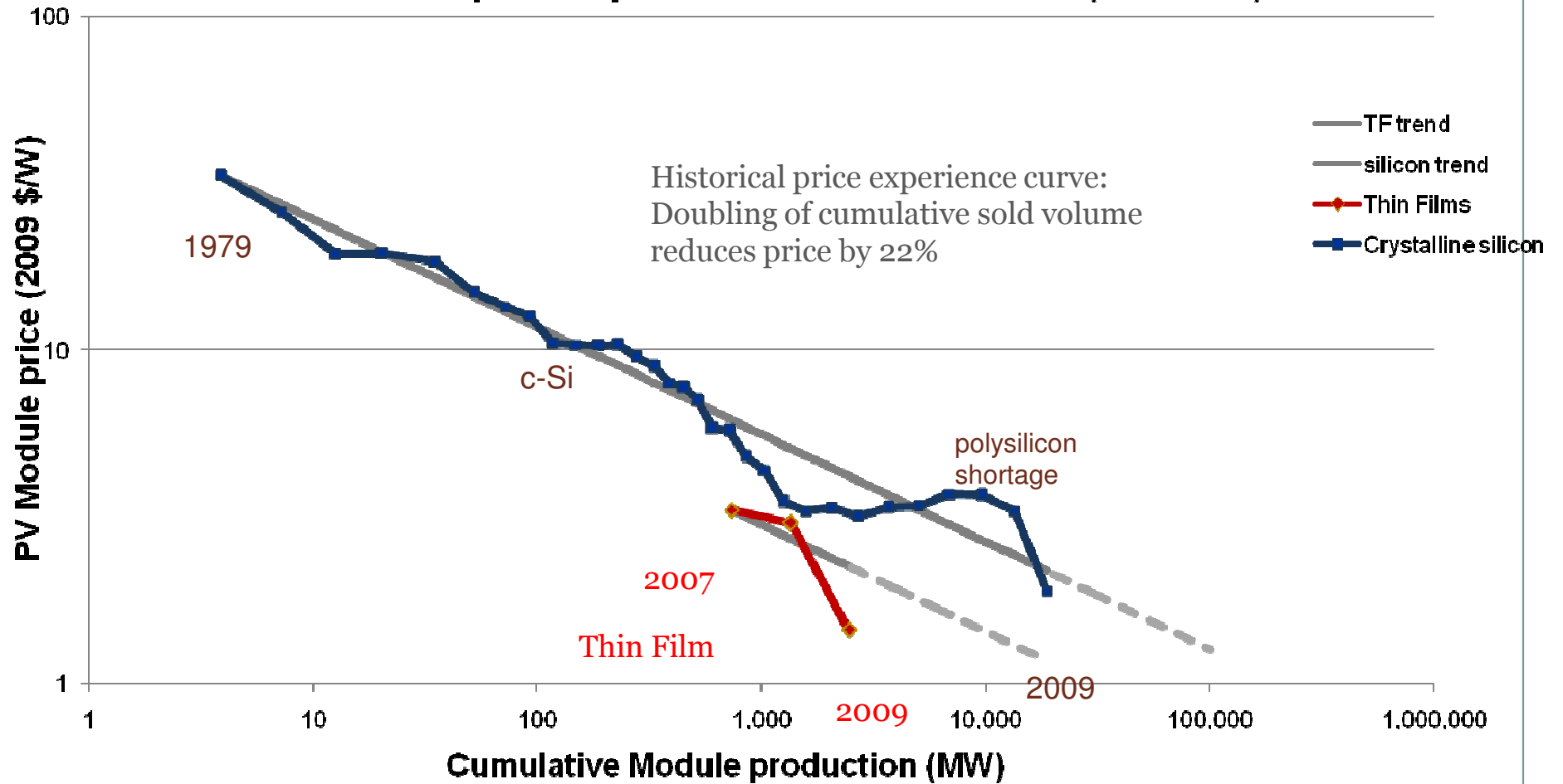


Data source: PV News, Photon International, Navigant Consulting, Supply and own analysis

Grid connected installations



PV Module price experience Curve since 1979 (2009 \$/W)



S JRC, Source: SET for 2020, EPIA 2009

SOLAR EUROPE INDUSTRY INITIATIVE
Setting The Pace Of The Solar Age

European PV Facts 2008

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- 2008 European sector turnover, without electricity sales > 15 billion €
- 2008 R & D investments in Europe > 400 million €
- 2008 PV jobs in Europe > 100,000
- 2009 PV jobs in Europe ~ 80,000 – 85,000
- 2003-2008 CAGR of EU annual market: 89%
- 2008 cumulative installed PV capacity
World ~ 15 GW
Europe ~ 9.7 GW
- 2008 CO₂ avoidance in Europe ~ 5 million t

Source: Joint Research centre, JRC

Wind im Aufwind

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• 2007:	global installed capacity by end of 2007	93 823 MW
	Newly installed capacity in 2007	19 865 MW
• 2008:	global installed capacity by end of 2008	120 791 MW
	Newly installed capacity in 2008	27 056 MW

2007:

US, China & Spain lead world wind power market in 2007

The Global Wind Energy Council today confirmed its earlier estimate that over 20,000 MW of wind power was installed in 2007, led by the US, China and Spain, bringing world-wide installed capacity to 94,112 MW. This is an increase of 31% compared with the 2006 market, and represents an overall increase in global installed capacity of about 27%. (Source: EWEA)

2008:

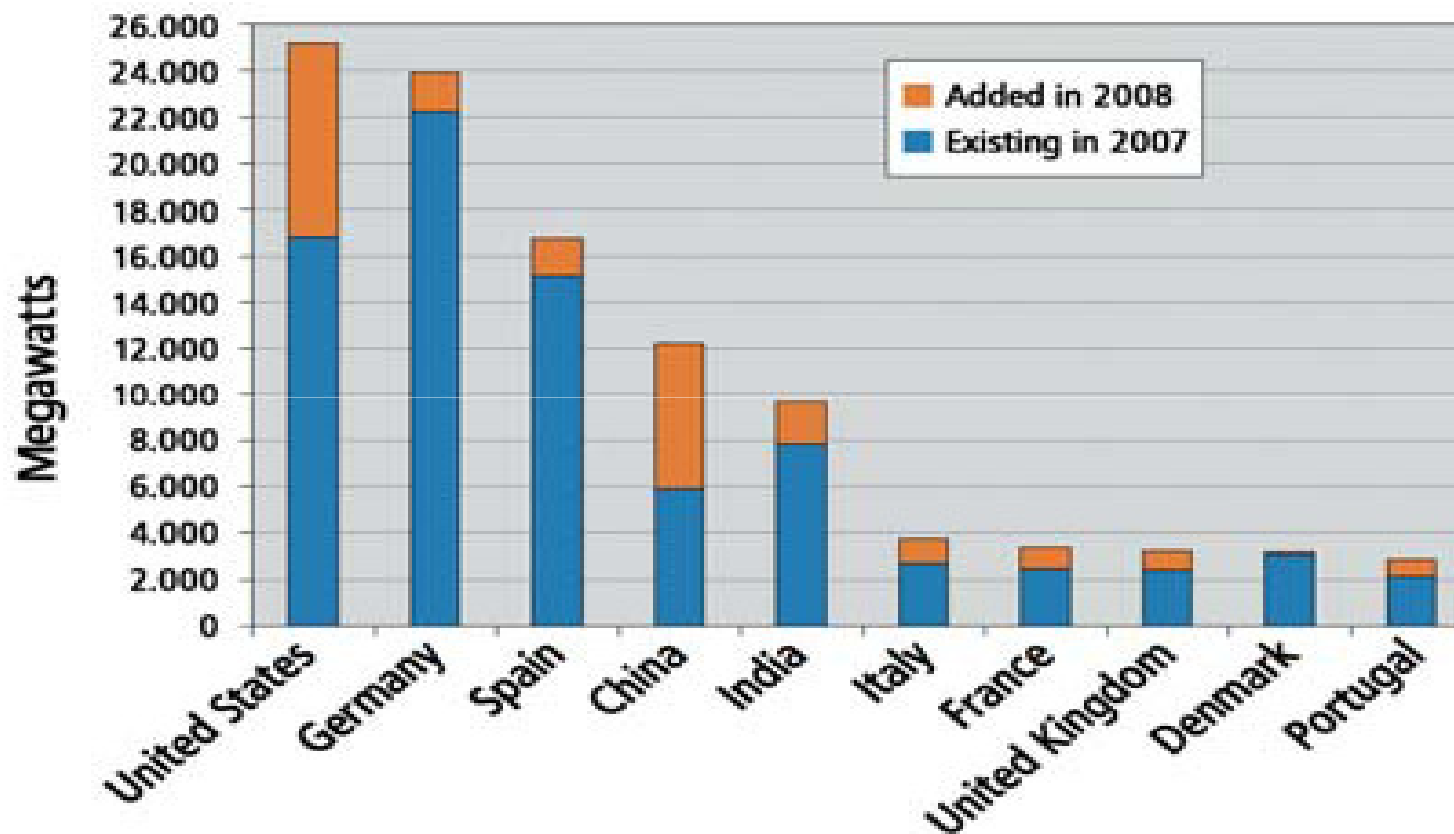
US and China in race to the top of global wind industry

The United States passed Germany to become world #1 in wind power installations, and China's total capacity doubled for the fourth year in a row. Total worldwide installations in 2008 were more than 27,000 MW, dominated by the three main markets in Europe, North America and Asia.

Global wind energy capacity grew by 28.8% last year, even higher than the average over the past decade, to reach total global installations of more than 120.8 GW at the end of 2008. Over 27 GW of new wind power generation capacity came online in 2008, 36% more than in 2007. (Source: EWEA)

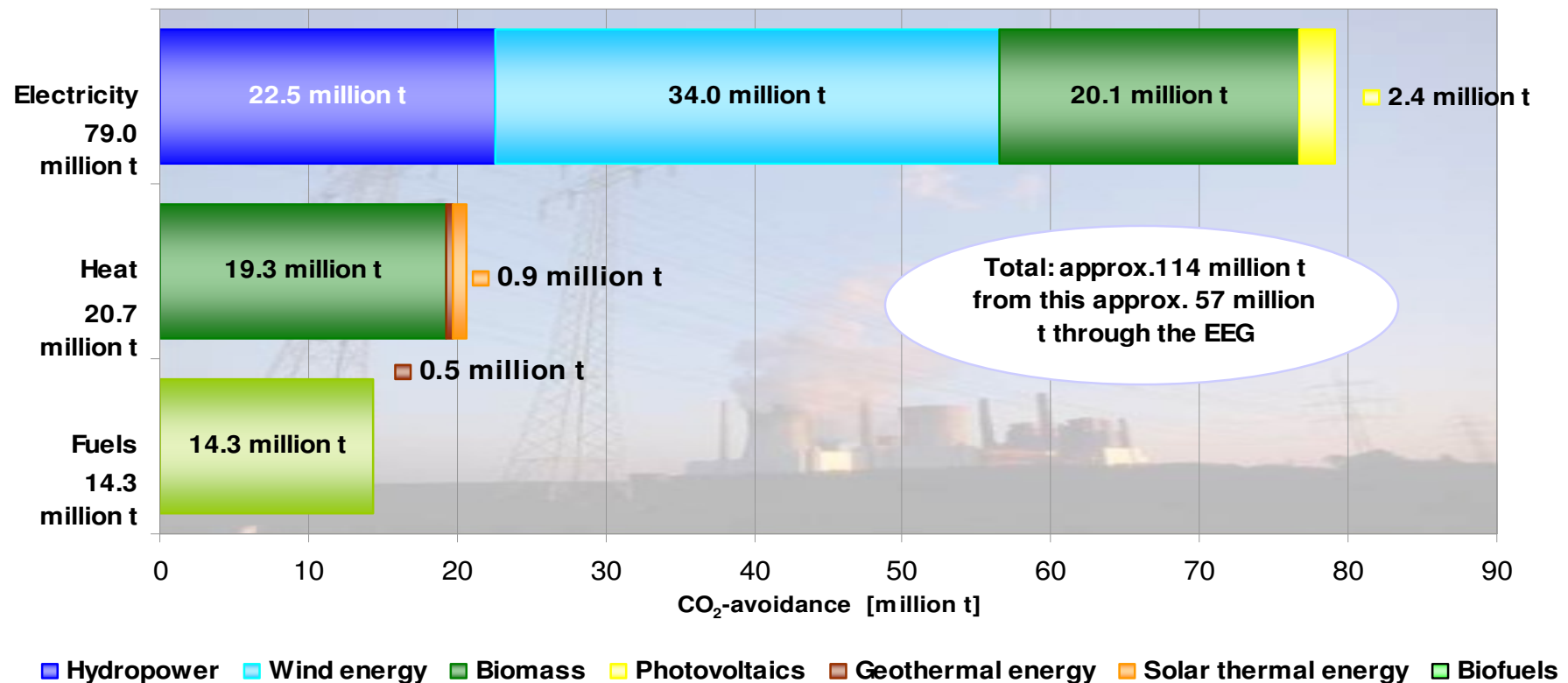
Figures from GWEC – Tables and Statistics 2008.

Figure 2.
Wind Power Capacity, Top Ten Countries, 2008



Renewables as Climate supporter

Emissions avoided through the use of renewable energy sources in Germany in 2007



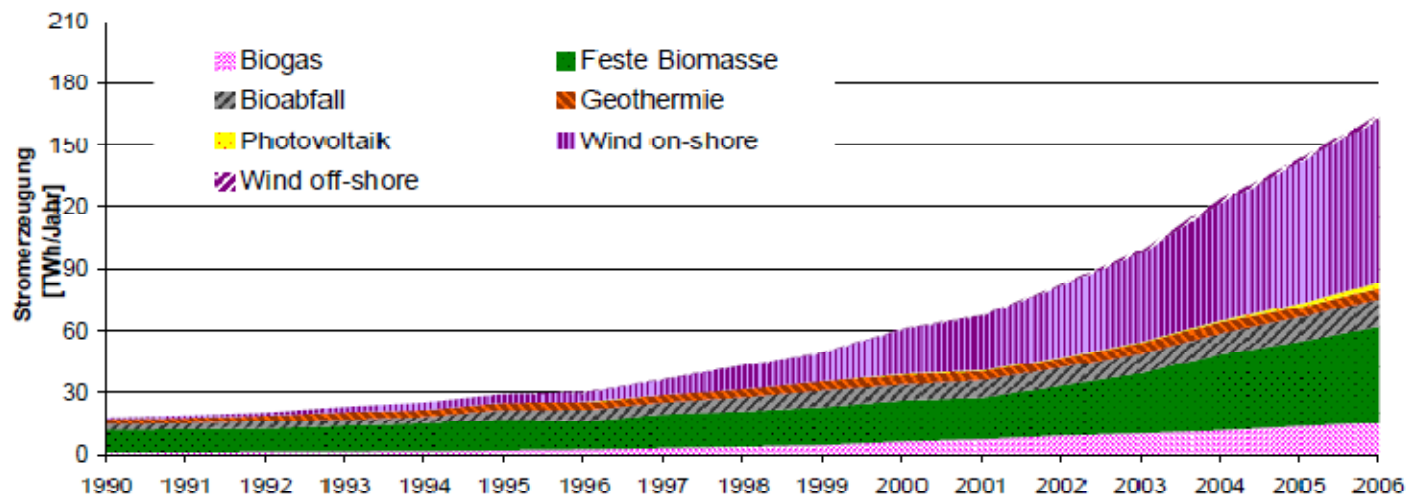
Version: March 2008; all figures provisional

Source: BMU according to Working Group on Renewable Energies / Statistics (AGEE-Stat)

Erneuerbare Technologien und Potenziale

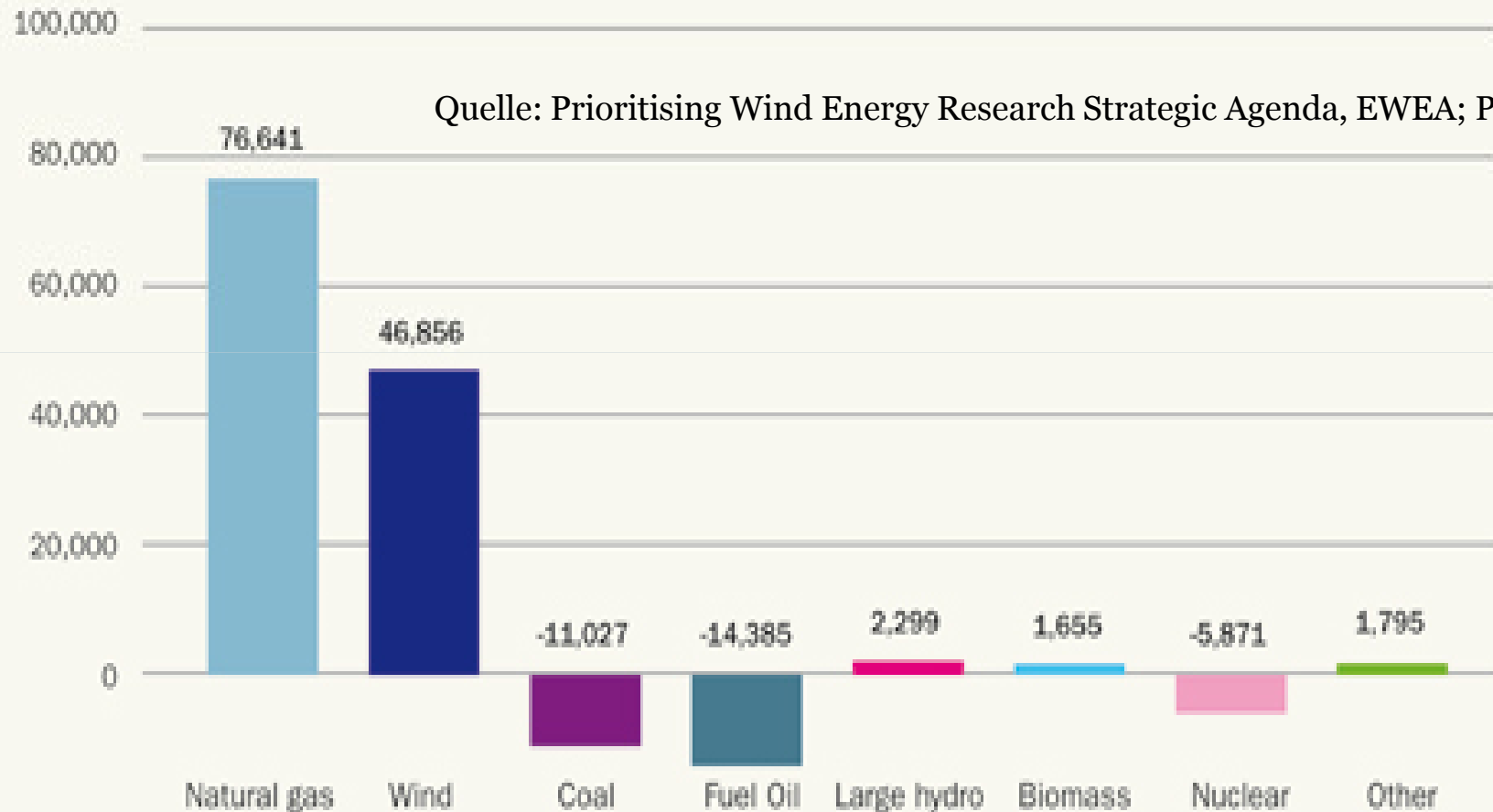
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“Das Wachstum im Bereich der Stromerzeugung aus erneuerbaren Energien wurde nur von einigen wenigen Mitgliedstaaten angetrieben. Begrenzt war auch das Spektrum der eingesetzten Technologien” (Kommission 2009)



Quelle: „Promotion and growth of renewable energy sources and systems“, Final Report, Ecofys et al. (ohne Berücksichtigung der Wasserkraft)

Netto Zuwachs/Verringerung in Stromkapazität EU 2000-2007 (in MW)



Stand 2008 in Nuklearreaktoren

New construction starts

Reactor	Country	Net-power, MW	Construction start	No. of reactors
Tianwan-2	China	950	2000	1
Kudankulam-1&2	India	1 834	2002	2
Kaiga-3&4	India	404	2002	2
Rajasthan-5	India	202	2002	1
Rajasthan-6	India	202	2003	1
Tomari-3	Japan	866	2004	1
Kalpakkam	India	470	2004	1
Olkiluoto-3	Finland	1600	2005	1
Lingao-3	China	1000	2005	1
Chasnupp-2	Pakistan	300	2005	1
Beloyarsk 4	Ryssland	750	2006	1
Lingao-4	China	1000	2006	1
QinshanII-3	China	610	2006	1
Shin-Kori-1	South Korea	960	2006	1
Qinshan II-4	China	610	2007	1
Severodvinsk Akademik	Ryssland	60	2007	1
Shin-Kori-2	South Korea	960	2007	1

12 778 **19**

(One reactor construction started in North Korea, but has since been discontinued.)

Permanently closed

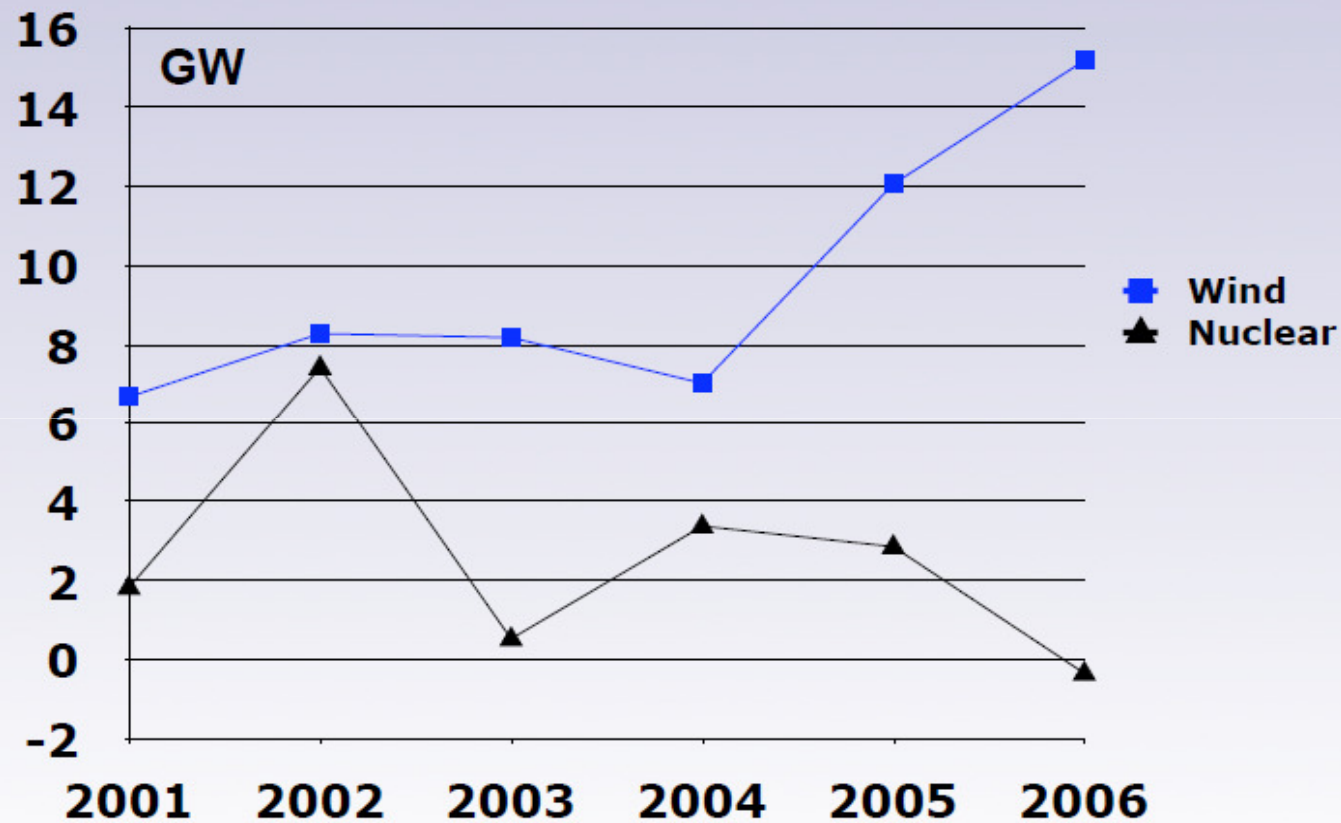
Reactor	Country	Net-power, MW	Closed	No. of reactors
Mulheim Karlich	Germany	1 219	2000	1
Hinkley Point A-1&A2	UK	235	2000	2
Tjernobyľ 3	Ukraine	925	2000	1
Bruce A-1	Canada	848	2001	1
Kozloduy 1&2	Bulgaria	816	2002	2
Bradwell-1&2	UK	246	2002	2
Calder Hall 1-4	UK	200	2003	4
Fugen	Japan	148	2003	1
Stade	Germany	640	2003	1
Chapelcross 1-4	UK	200	2004	4
Ignalina-1	Lithuania	1 185	2004	1
Obrigheim	Germany	340	2005	1
Barsebäck-2	Sweden	600	2005	1
Jose Cabrera 1 (Zorita)	Spain	142	2006	1
Sizewell A 1-2	UK	420	2006	2
Dungeness A 1-2	UK	450	2006	2
Kozloduy-3 and -4	Hungary	816	2006	2
Bohunice-1	Slovakia	408	2006	1

9 838 **30**

©Fredrik Lundberg, Tomas Kåberger

Source: <http://www.iaea.org/programmes/a2/index.html>

Increase in global grid connected power



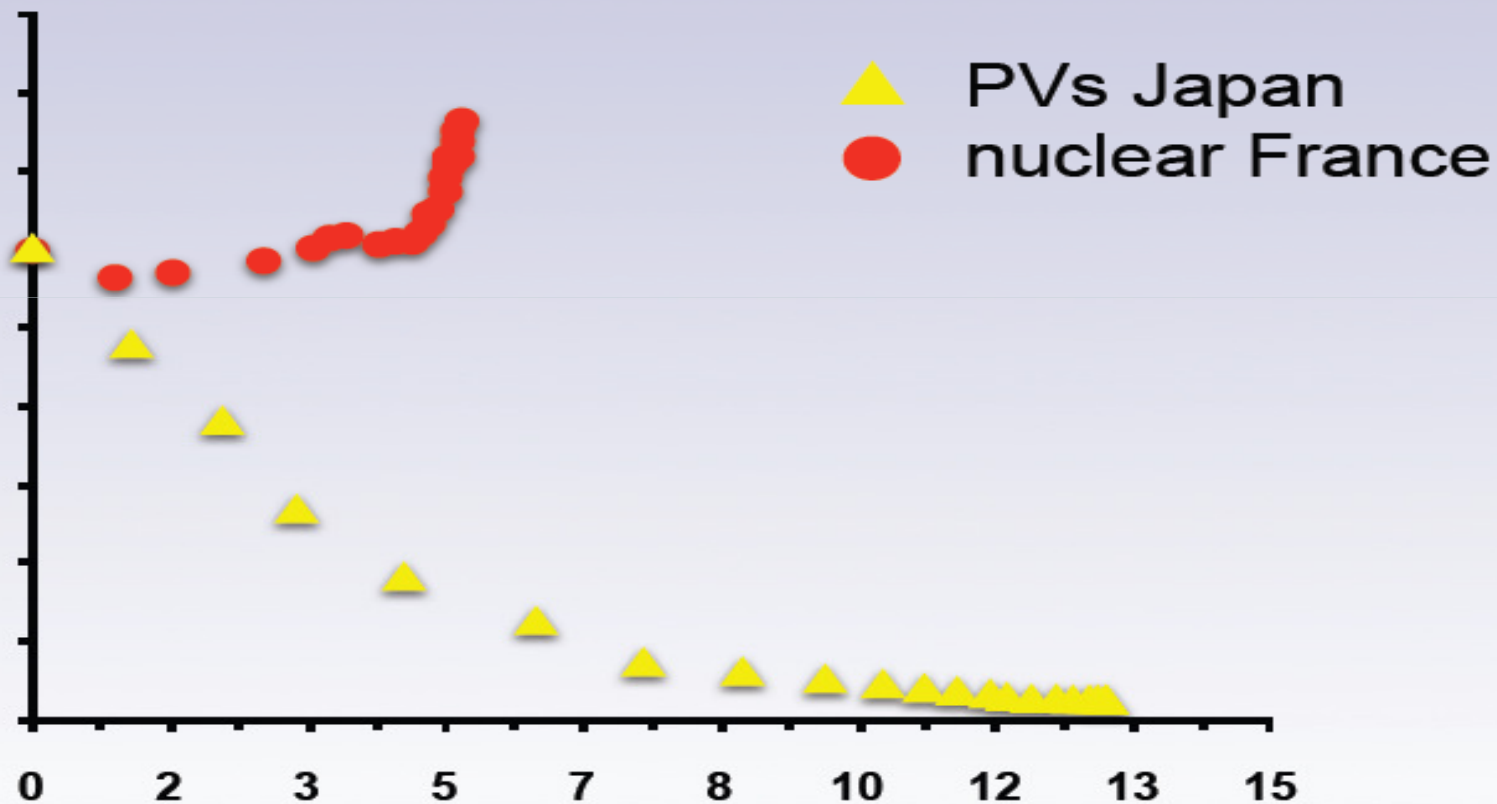
the international institute for
industrial environmental economics
Lund University, Sweden

iiiee

Nuklear kennt keine Kostendegression

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Learning may increase costs



„If governments do not facilitate the investment, I don't think nuclear will fly“

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*OECD International Energy Agency
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Was ist eine Atom-Förderung?

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- Mehr als Beihilfe: Förderungen, neben Subventionen im engeren Sinne (Finanzhilfen und Steuervergünstigungen) auch staatliche Regelungen einbeziehen, die die Atomenergie begünstigen, ohne dass eine Budgetwirkung auf die öffentlichen Haushalte entsteht.
- Dennoch entstehen Wettbewerbsverzerrungen

Beispiele für Förderungen

(Greenpeace/FÖS, 2009 Staatliche Förderungen der Atomenergie im Zeitraum 1950 – 2008)

Tabelle 1) Arten von Subventionen mit Beispielen aus dem Energiebereich			
Subventionen mit Budgetwirkung			Subventionen ohne Budgetwirkung
(A) Ausgabenseite: Finanzhilfen Reale Transaktionen (Bar-, Beschaffungs- u. Verbilligungssubv.) Zinsvergünstigungen Bürgschaften, Garantien, Gewährleistungen, Beteiligungen	(B) Einnahmen seite: Steuervergünstigungen	(D) Nicht internalisierte externe Kosten des Energieverbrauchs	(C) Regelungen mit Subventionscharakter Durch wettbewerbsbeeinträchtigende staatliche Regelungen entstehen den Begünstigten Vorteile
Beispiele aus dem Energiebereich			
<ul style="list-style-type: none"> - Steinkohlesubventionen - Förderprogramme regenerative Energieträger und Energieeffizienz - Forschung und Entwicklung (insbes. Atom, regenerative Energieträger) - Vorbereitungsmaßnahmen bzw. Renaturierung für Braunkohletagebau - Beteiligung an Finanzierung und Risiken der Atommüllentsorgung und -transporte - Bürgschaften / Kredite für Kraftwerke - Zuschüsse / Darlehen zur Finanzierung der Energie-Infrastruktur 	<ul style="list-style-type: none"> - Steuervergünst. im Rahmen der Energiebesteuerung - Steuervergünst. im Rahmen der Einkommensteuer (Entfernungspauschale, Eigenheimzulage) - Steuervergünst. durch Rückstellungen in der Atomwirtschaft 	<ul style="list-style-type: none"> - Treibhausgas-, Luftschadstoff-, nicht-stoffliche Emissionen - Fläche, Ökosysteme - Prozesskette (dem Betrieb vor- bzw. nachgelagerte Prozesse) - Haftungsbegrenzung in Atomwirtschaft 	<ul style="list-style-type: none"> - Jahrhundertvertrag zugunst. Steinkohle - Unvollständiger Wettbewerb in der Elektrizitätswirtschaft - Erneuerbare Energien Gesetz - Vorteile für bestimmte Energieträger im Rahmen des Emissionshandels - Handelsbeschränkungen
Subventionen im engeren Sinne			Erweiterter Subventionsbegriff

Internationale Definition von Energiesubvention

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FÖS/Greenpeace

Tabelle 1) Internationale Definitionen von Energiesubventionen

UNEP/ OECD/ IEA ¹	EU ²
Any government action that concerns primarily the energy sector that	All measures that offer direct or indirect advantages to energy sources, in particular:
<ul style="list-style-type: none">• lowers the cost of energy production	<ul style="list-style-type: none">• reduce costs for consumers and producers
<ul style="list-style-type: none">• raises the price received by energy producers	<ul style="list-style-type: none">• maintain producer prices higher than market prices
<ul style="list-style-type: none">• lowers the price paid by energy consumers	<ul style="list-style-type: none">• maintain consumer prices below market prices

Die heimlichen Verführer

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- Zwischen 1968 und 1973 etwa fiel in Deutschland der Innenfinanzierungsanteil (Eigenkapital) beim Kraftwerksbau von 75 % auf 50 %, bedingt durch die lange Bauzeit und hohen Investitionen bei Atomkraftwerken.
- Die Atomwirtschaft sah den Innenfinanzierungsanteil für die kommenden Jahre und den weiteren Ausbau der Kernenergie weiter sinken und hoffte auf staatliche Unterstützung wie "*[...] Abschreibungen während der Bauzeit, Sonderabschreibungen auf Kernkraftwerke, aber auch Abschreibungen zu Wiederbeschaffungskosten oder spezielle Rücklagen wesentlich mit dazu beitragen, den Innenfinanzierungsanteil nachhaltig zu steigern und die Außenerfordernisse entsprechend zu reduzieren. Steuerliche Vergünstigungen dieser Art lassen sich angesichts der besonderen Rolle der Energiewirtschaft und ihrer Schlüsselrolle für die wirtschaftliche Entwicklung in der Bundesrepublik sicherlich rechtfertigen, allerdings wird die volle Ausschöpfung von Steuervergünstigungen wiederum davon abhängen, ob es auch in Zukunft gelingen wird, ausreichende Stromerlöse zu erzielen*".
- Diese "ausreichenden Stromerlöse" wurden durch die Monopolstellung der EVU gewährleistet, der heutige Atomstrompreis wiederum wird nochmals begünstigt durch die mittlerweile abgeschriebenen Kraftwerke.

Atomwirtschaft 1975 S. 409 f.
FÖS/Greenpeace 2009

Deutschland und Nuklear

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- Die für die öffentlichen Haushalte budgetwirksamen Förderungen betragen im Zeitraum bis 2008 95,6 Mrd. € nominal bzw. 126,2 Mrd. € in Preisen 2008 (siehe Summe 1 in der Tabelle). Pro Kilowattstunde Atomstrom entspricht dies einer durchschnittlichen Förderung von 2,3 Ct/kWh nominal bzw. 3,0 Ct/kWh real (in Preisen 2008).
- Einschließlich des Vorteils der Atomenergie durch den Emissionshandel sowie aus Bürgschaften beträgt der Förderwert 101,7 Mrd. € nominal bzw. 132,6 Mrd. € in Preisen 2008 (siehe Summe 2 in der Tabelle). Pro Kilowattstunde Atomstrom entspricht dies einer durchschnittlichen Förderung von 2,4 Ct/kWh nominal bzw. 3,1 Ct/kWh real (in Preisen 2008).
- Der Förderwert der staatlichen Regelungen im Atombereich im Zeitraum 1950 bis 2008 ohne Berücksichtigung von externen Kosten beträgt 128,5 Mrd. € nominal bzw. 165,5 Mrd. € in Preisen 2008. Pro Kilowattstunde Atomstrom entspricht dies einer durchschnittlichen Förderung von 3,0 Ct/kWh nominal bzw. 3,9 Ct/kWh real.

Deutschland und Nuklear II

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- Bezüglich der externen Kosten wurden die Ergebnisse konservativ für eine auf 2-20 Ct/kWh eingeschränkte Bandbreite möglicher Ergebnisse dargestellt. Die Gesamtsumme aller Förderungen im Atomsektor hängt zentral davon ab, welche Annahme bezüglich der externen Kosten getroffen wird.
- Die heute schon bekannten zukünftigen Ausgaben bzw. sonstigen staatlichen Regelungen mit Förderwert für die Atomenergie belaufen sich allein im Bereich der budgetwirksamen Förderungen auf **32,8 Mrd. €** (Summe 1). Bei zusätzlicher Berücksichtigung des Förderwerts des Emissionshandels und von Bürgerschaften sind es **63,8 Mrd. €** (Summe 2).
- Die gesamte Bruttostromerzeugung im Zeitraum 1950 bis 2008 betrug 4.241 TWh.

		Nominal (Mrd. €)	Real (Preise 2008)	Förderwert ab 2009
A.	Finanzhilfen	40,7	> 61,3	7,1
A.1.	Forschung D	22,8	41,2	1,4
A.2.	Ausgaben Bundesländer	5,0	5,2	k.A.
A.3.	Euratom + Phare (Anteil D)	1,9	2,5	0,5
A.4.	Stilllegung Ost-D AKW	2,7	> 2,7 *	1,0
A.5.	Wismut Sanierung	5,1	6,1	1,1
A.6.	Morsleben	1,1	> 1,1 *	1,2
A.7.	Asse	0,3	> 0,3 *	2,0
A.8.	Endlager Standort-Suche	0	0	0
A.9.	Tschernobyl	0,4	> 0,4 *	k.A.
A.10.	Beiträge internat. Organisationen	1,3	> 1,8 *	k.A.
B.	Steuervergünstigungen	54,9	> 64,9	25,6
B.1.	Rückstellungen	20,1	24,5	25,6
B.2.	Steuervergünst. Energiesteuer netto	34,8	40,5	
C.	Budgetunabh. staatliche Regelungen	32,9	> 39,3	31,0
C.1.	Strompreiserhöhung durch Emissionshandel	6,0	6,2	31,0
C.2.	Bürgschaften	0,14	> 0,14 *	0,0
C.3.	Unvollständ. Wettbewerb in Elektrizitätswirtschaft	26,8	33,0	k.A.
D.	Externe Kosten			
	a) Bei Annahme: 1 Ct/kWh	33,3	42,3	12,4
	b) Bei Annahme: 2 Ct/kWh	66,7	84,5	24,8
	b) Bei Annahme: 7,5 Ct/kWh	250,0	317,0	93,1
	c) Bei Annahme: 20 Ct/kWh	666,6	845,4	248,3
A. +B.	Summe 1: Budgetwirksame Förderungen	95,6	> 126,2	32,8
	<i>Durchschnittlich in Ct pro kWh</i>	<i>2,3</i>	<i>> 3,0</i>	<i>2,6</i>
A.+B.+ C.1.-2.	Summe 2: Budgetwirksame Förderungen + Vorteile Emissionshandel + Bürgschaften	101,7	> 132,6	63,8
	<i>Durchschnittlich in Ct pro kWh</i>	<i>2,4</i>	<i>> 3,1</i>	<i>5,1</i>
A. - C.	Summe 3: Alle Förderungen außer externe Kosten	128,5	> 165,5	k.A.
	<i>Durchschnittlich in Ct pro kWh</i>	<i>3,0</i>	<i>> 3,9</i>	
A. - D.	Summe 4: Förderwert aller staatlichen Regelungen im Atomsektor	abhängig von Annahme bei externen Kosten!!		
* Inflationsbereinigung nicht möglich, weil verwendete Quelle nur kumulierte Zahl, keine Einzeljahre ausweist.				

Klassische EE wird die Fördermechanismen bald nicht mehr benötigen

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- Vor allem Onshore Wind und PV, aber

Nuklear:

- “New nuclear power stations will not be built in Britain unless the government provides financial support for the industry (...) Vincent de Rivaz, chief executive of the UK subsidiary of EDF, told the Financial Times that a “level playing field” had to be created that would allow the nuclear industry to compete with other low-emission electricity sources such as wind power.” Financial Times May 26 2009

Die Zukunft ist da

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- EDF in Großbritannien fürchtet, dass Fördermaßnahmen für erneuerbare Energien zu zuviel Wind führen könnte: “wind capacity being built that nuclear power stations will have to be shut down at times of high wind power output, jeopardising the economics of new reactors.”
- “Ed Miliband, the UK energy secretary, recently told the Financial Times that the government’s policy was not to subsidise nuclear power. “I think we are right not to subsidise new nuclear power stations because we have an obligation to get to a low-carbon future at the lowest cost to the billpayer,” he said.”
- Quelle: Financial Times

14 Top Runner in der Liga der schädlichen Subventionen

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- Absence of charges on GHG emissions
- Oil security costs' subsidies
- Cross-subsidies in electricity markets
- Under taxed or untaxed Windfall profits for incumbent utilities
- Cap on liability for accidents in nuclear power
- Domestic subsidies to energy consumption
- Subsidies for nuclear waste disposal
- Reserve funds for future nuclear related dismantling in the budget of big utilities
- Subsidies for dismantling and clean up of contaminated nuclear sites
- Tax exemptions for petroleum use in international transportation
- Tax credits for “clean” coal production
- Coal subsidies in Germany and elsewhere
- Carbon Sequestration funding and socialization of risks
- Imbalance of research funds allocation

Kein Ausverkauf nationaler Anstrengung



- Es geht um Nachhaltigkeit, Klima und Versorgungssicherheit, darum wird ein Ablasshandel über Nationale Programme mit zu hohem Anteil von Projekten in Drittstaaten und statistischen Transfer nicht akzeptiert werden können.

Barriers and Harmful subsidies

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- EC Commission attests “serious malfunctions in EU energy markets” (EC Commission MEMO/06/78 from February 2006)
- Harmful subsidies to the traditional fossil and nuclear sector amount to 250 billion US\$ worldwide per year, representing “a substantial market distortion, discourage new entrants into the market, and undermine the pursuit of energy efficiency”. (*José Goldemberg, Thomas.B.Johansson, World Energy assessment, Overview 2004 Update (UNDP,2004, page 72)*)
- Barrier market - fails to focus and internalise all negative effects of conventional energy use into the price for electricity, so that the price for electricity on these markets are not cost related prices. (*Goldemberg, Johansson*)
- It is not the renewable energy which is too expensive but the traditional energy which is made to be too cheap.

Das Marktproblem

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- “Even though some RE technologies without any support are at cost levels comparable with those of conventional sources of energy, unsupported new renewable energy is still not commercially competitive in the **current distorted electricity market**. This deformation of the internal EU 27 electricity market is especially caused by public direct and indirect subsidies. “

Source: Fouquet, Johansson: European renewable energy policy at crossroads – focus on electricity support mechanisms, 2008

- “UNEP, the World Bank and the International Energy Agency put global **annual** subsidies for fossil fuels in the range of US\$100-200 billion, representing “a substantial market distortion, discourage new entrants into the market, and undermine the pursuit of energy efficiency”

Source: Fred Beck, Eric Martinot ,Renewable Energy Policies and Barriers, in Encyclopaedia of Energy, Cutler J. Cleveland, ed. (Academic Press/Elsevier Science, 2004)

Der ewige Windfall

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- Windfall profits or producer rents resulting from marginal cost pricing and earned by electricity companies owning large depreciated nuclear and lignite fuelled utilities (especially in Germany and France) – Estimated for 2005 and 2006 together for the companies RWE, EnBW, E.On and Vattenfall Europe with their German operations at the order of 8.2 bill Euros and for EDF in France at 13 bill Euros.

Source: Uwe Leprich, The Crisis of the Electricity Markets in Europe: Problems and Consequences, 2005

- Windfall profit derived to passing on a large share of the not occurring additional costs for Greenhouse gas (GHG) emissions allowances by electricity producers to customers. Free allocation or so-called grandfathering is rectified under current ETS Directive just allowing 5 % allowances' auctioning between 2005 and 2008 and 10 % between 2008 and 2012. This will start to change under the new ETS system.

Fragen (IIIEE Schweden *)

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- What degree of proliferated capacity for nuclear and radiological weapons shall we accept?
- Who should pay for nuclear accidents?
- How many expected deaths from routine emission shall be allowed?
- Nuclear waste: What shall be allowed? And who should pay?
- Should support to nuclear power under competitive market regimes be allowed?

* <http://www.iiiee.lu.se/>

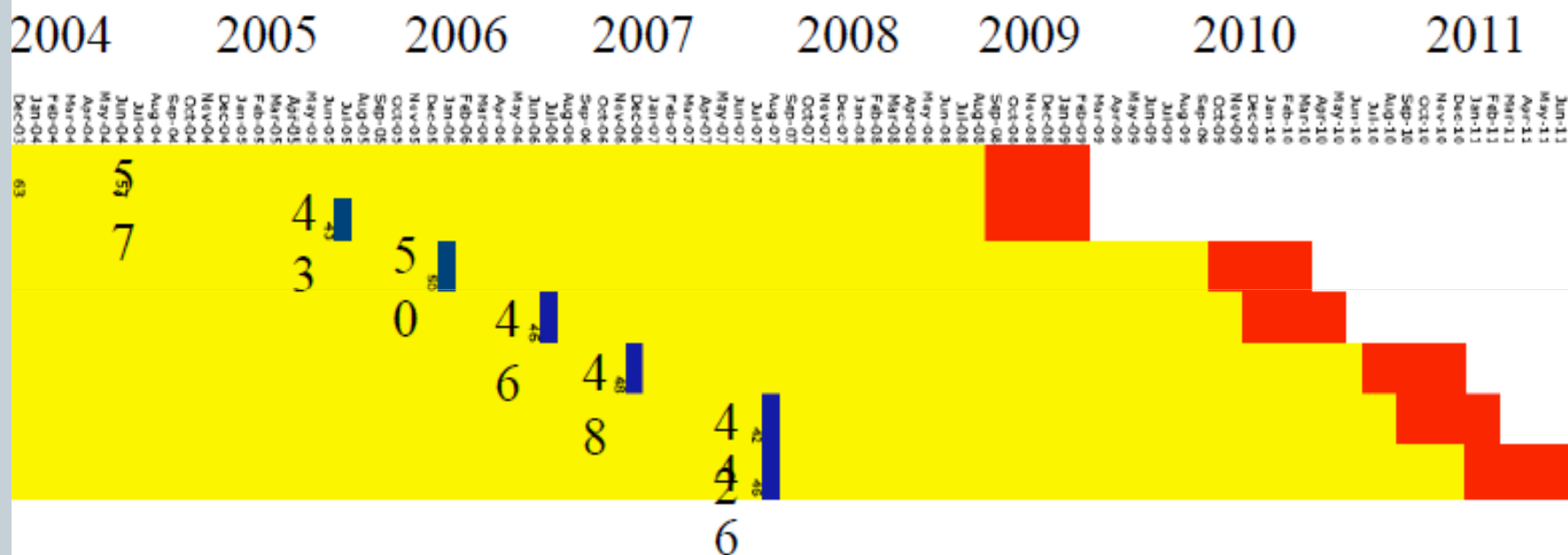
Offene Beihilfefälle

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- “TVO complaint” by EREF before EU Commission dated from 14.12.2005
- Major content of complaint:
Syndicated loan leading bank Bayerische Landesbank in 2003/2004 to TVO of € 1.95 bio = more than 60 % of fixed price contract at an interest of 2.6 %
- EC First Instance: case not admissible
- Appeal to ECJ launched by EREF in February 2010

Immer im Rückstand : TVO

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“We do not need to change the time schedule,
remaining construction time is constantly around 50 weeks.”

EPR (Ad)venture in Finland: TVO not without State Aid

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- The new plant project in Finland is welcomed by many including the EU Commission for market oriented non subsidy approach
- This is fake: Big spenders were the Swedish Government (worth 100 Mio €)
- French Export Guarantee (COFACE) of non notified amount of 610 million EUR – to AREVA, the second highest ever reported for COFACE
- Banking Consortium under direct participation of public Bayerische Landesbank which apparently gave in 2003 or in the beginning of 2004 a EUR 1,95 billion syndicated credit for an interest of 2,6% to the Finnish company Teollisuuden Voima Oy (TVO)

“Jumbo problems hit France’s nuclear ambitions”

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By Paul Betts

Financial Times, November 2 2009 18:18

The new-generation European pressurised reactor, which was supposed to spearhead French exports of the country’s nuclear *savoir-faire* around the world, appears to be presenting one problem after another for Areva, its designer. Indeed, Siemens has now decided to opt out of its engineering partnership with Areva.

This week, safety authorities from three countries – France, Finland and the UK – asked the French group to modify the control and command systems of the EPR. This is just the latest in a series of embarrassing setbacks that have already cost Areva in Finland alone, where one of the very first EPRs is being assembled, about €3.2bn in provisions so far.---

While two EPRs are being built in Finland and France, none is yet in service. The prototype EPR, at Olkiluoto in western Finland, is running three years late and billions of euros over budget.

Aufsichtsbehörden schlagen Alarm

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- Times on Line, 1/7/09

http://business.timesonline.co.uk/tol/business/industry_sectors/natural_resources/article6613960.ece

French plans to lead a nuclear power renaissance in Britain have been dealt a major blow after regulators warned of serious reservations about the safety of the reactor technology earmarked for use. The Nuclear Installations Inspectorate (NII) has written to EDF and Areva, the French companies that want to build four reactors in the UK, to express their concerns about the technology. The letter sets out concerns about the control and instrumentation (C&I) of Areva's European Pressurised Reactor (EPR).

Described by one nuclear industry source as the "cerebral cortex" of a nuclear power station, C&I governs the computers and systems that monitor and control the station's performance, including temperature, pressure and power output levels. The NII, which is conducting a detailed review of two reactor designs for the UK, said the EPR technology was significantly compromised because of the interconnectivity of what were meant to be independent systems designed to operate the plant and ensure its safety.

Immer Ärger mit Sicherheit

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The Health and Safety Executive, which oversees the NII, said that the EPR design could be rejected for use in Britain if its concerns could not be satisfactorily addressed. “It is our regulatory judgment that the C&I architecture appears overly complex,” the NII letter said. “We have serious concerns about your proposal which allows lower safety class systems to have write access [the ability to override] to higher safety class systems,” it continued.

The letter also highlighted concerns about the absence of safety display systems or manual controls that would allow the reactor to be shut down, either in the station’s control room or at an emergency remote shutdown station. The NII’s warning will compound the view that EDF, the utility giant that is 85 per cent owned by the French state, is unlikely to meet its target of building its first UK reactor within eight years.

Areva is already scrambling to produce revised plans but the design assessment phase could be delayed well past its expected completion in 2011.

EDF wants to build four reactors in Britain at two sites, Hinkley Point in Somerset and Sizewell in Suffolk. Last year it spent more than £12 billion acquiring British Energy, the UK nuclear generator, to secure access to them.

The French-designed EPR is the world’s most powerful nuclear reactor. Each is capable of generating 1,600 megawatts of electricity — enough to supply a city of nearly 2 million people.

Förderungen für Nuklear global

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“More than half of the subsidies (in real terms) ever lavished on energy by OECD governments have gone to the nuclear industry.”

(The Economist, **Nuclear power Out of Chernobyl's shadow** May 6th 2004, from print edition)

Example US:

- Wind, solar and nuclear power got around \$150 billion in cumulative US Federal subsidies over roughly fifty years, some 95% of which supported nuclear power.
- Nuclear power received far higher levels of support per kilowatt-hour generated early in its history than did wind or solar.

Subsidies II

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- Between 1947 and 1961: Commercial, fission-related nuclear power development received subsidies worth \$15.30 per kWh.

This compares with

- subsidies worth \$7.19/kWh for solar and
- 46¢/kWh for wind between 1975 and 1989.
- In their first 15 years, nuclear and wind technology produced comparable amount of energy (2.6 billion/Nucl. and 1.9 billion kilowatt-hours/wind), but the subsidy to nuclear outweighed that to wind by a factor of over 40, at \$39.4 billion to \$900 million.

(Source: **FEDERAL ENERGY SUBSIDIES: NOT ALL TECHNOLOGIES ARE CREATED EQUAL** by Marshall Goldberg, REPP, July 2000 • No. 11)

Subsidies III: Who pays for back end costs for Nuclear power plants?

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- Example UK

De-regulation of UK power markets and privatisation of nuclear power, shareholders of British Energy (BE) were firstly regarded by UK government as being responsible for these costs. After electricity prices fell and BE collapsed, the British government burdened future taxpayers with many of the costs, as much as a century forward. If not done, the book value of BE's equity would have been about (minus) -3.5 billion pounds. BE's liabilities would have been about minus 3.5 billion pounds greater than their assets:

Subsidies: Who pays..? (II)

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- *BE's short- and long-term nuclear liabilities are 4199 million pounds. Nuclear liabilities are here expressed in present value terms. Thus, if all the back-end costs were incurred "today," they would total 4199 million pounds for the UK alone*

(see "Viewpoint, De-regulated electric power markets and operating nuclear power plants: the case of British energy, James G. Hewlett Energy Information Administration, US Department of Energy, 1000 Independence Ave, SW, Washington, DC 20585, USA)

- **Conclusion: Nuclear industry can only survive under state protected not really market oriented conditions**

Economic issues

- British privatisation ->
- Subsidies of BNFL and BE: **G€ 10**
- "If British Coal were paid the same subsidy per unit as Nuclear Electric, British mines could supply their coal to the generators for free, deliver it free, give the generators £10 a tonne to burn it, and leave themselves with another £10 profit."

*Malcolm Edwards, BC
commercial director*

„If governments do not facilitate the investment, I don't think nuclear will fly“

Fatih Birol, Chief Economist

*OECD International Energy Agency
in: The Economist, 9 November 2006*

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