



energy revolution

Your guide to making it happen

Howard Johns

IPCUK2015

the problem



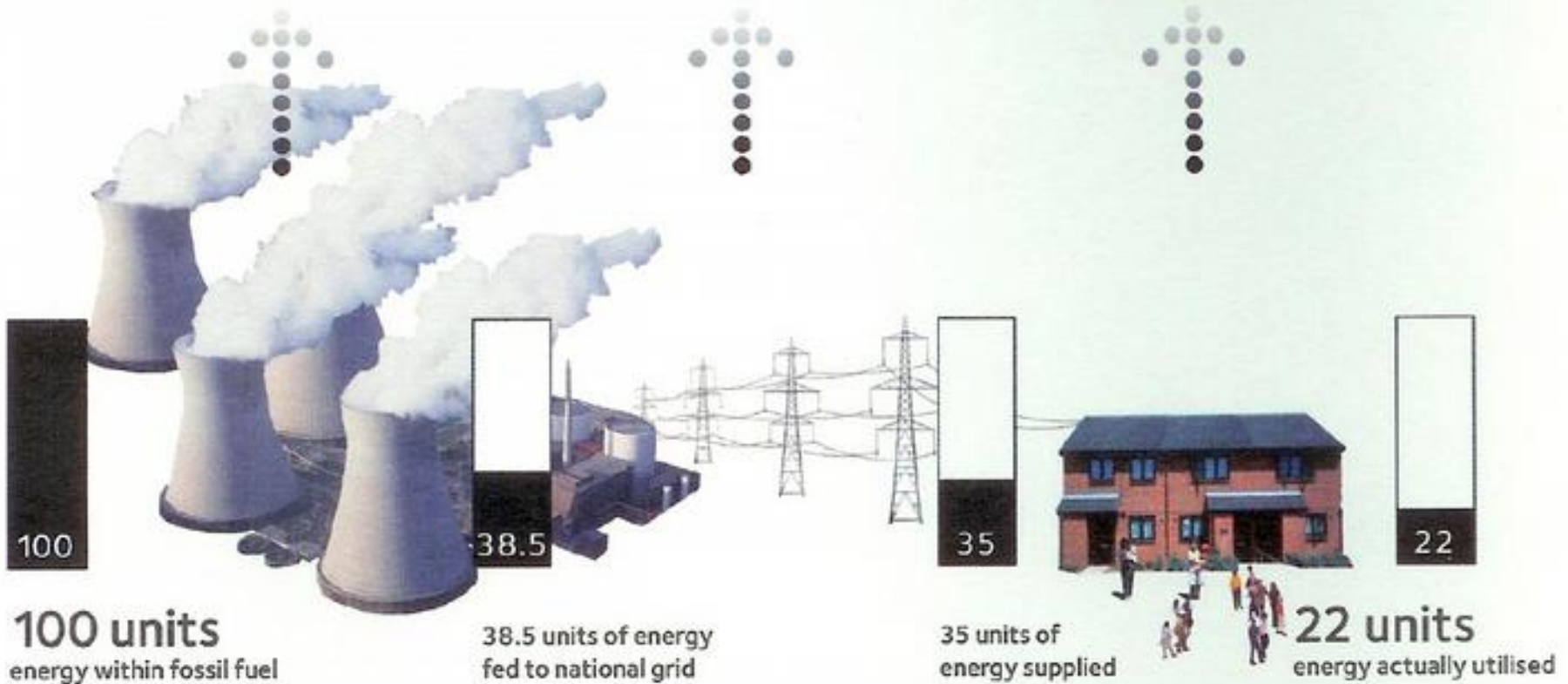
flick the switch

energy excess

61.5 units
lost through inefficient
generation and heat wastage

3.5 units
lost through transmission
and distribution

13 units
wasted through
inefficient end use





fracking salvation



the nuclear renaissance

Finnish new build: 3.2 billion euros > estimated cost 8.5 billion euros

Subsidy for 1 new nuclear power station in UK could be £17Bn

Estimated clean up cost of existing UK power stations £80-220Bn

3 billion

energy poverty

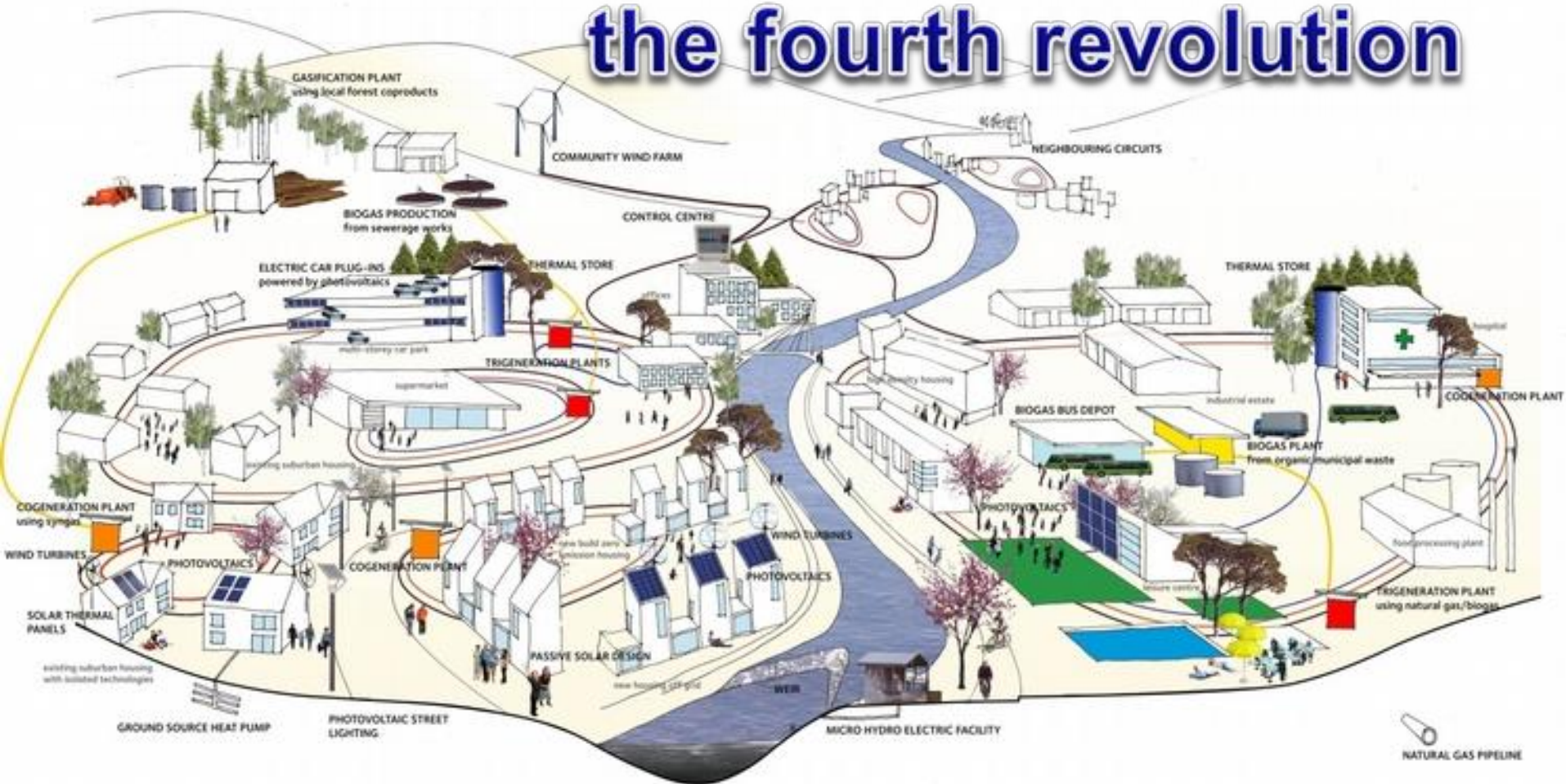




the third revolution

the solution

the fourth revolution



the energy revolution

UK

offshore wind



14% renewable electricity 2014

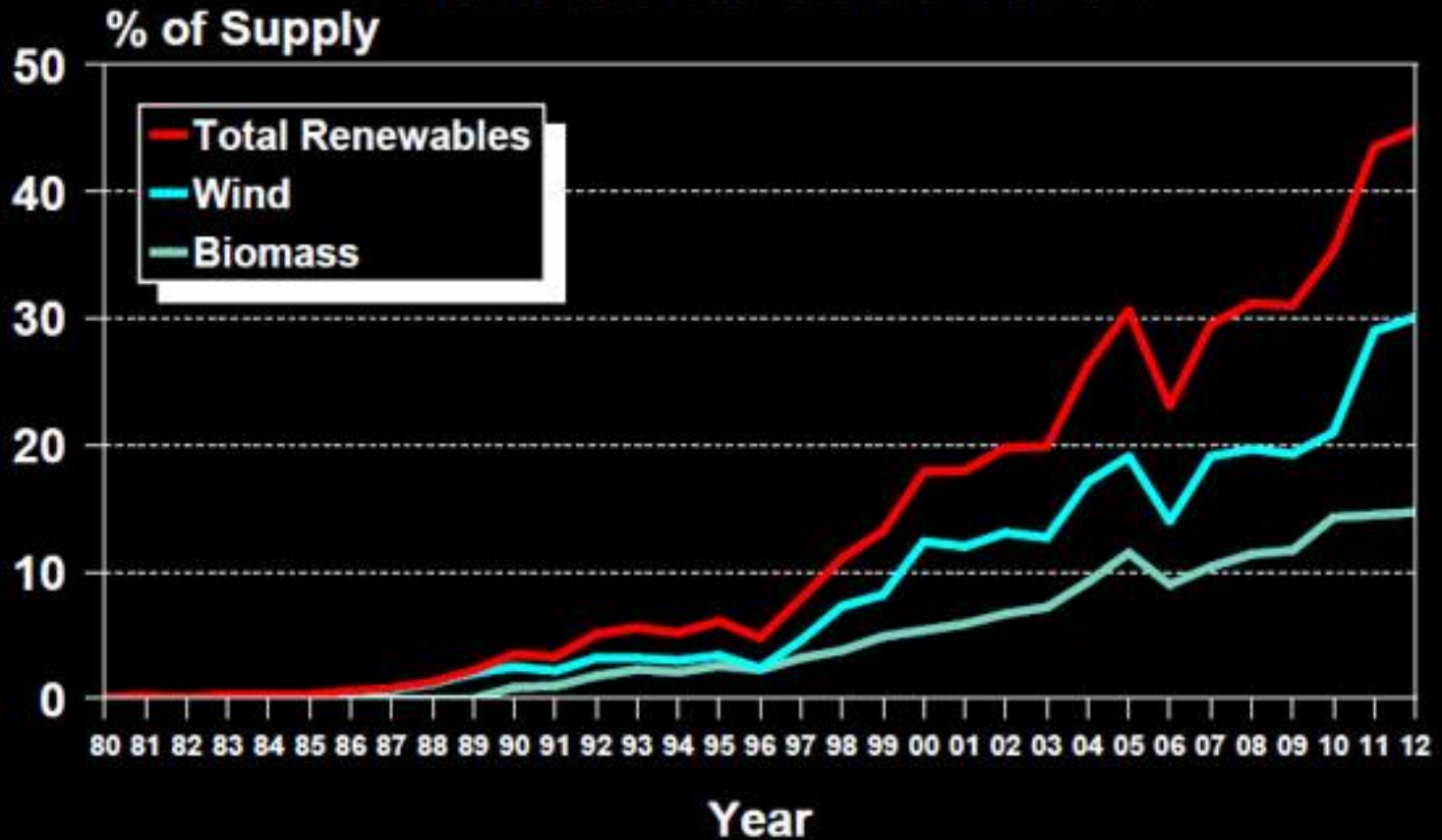
UK



First mover communities

Denmark

Denmark Total & Non-Hydro Renewable Generation 1980-2012



2014 - 40% of Electricity from Wind power

Denmark

Samsø



Denmark

Samsø

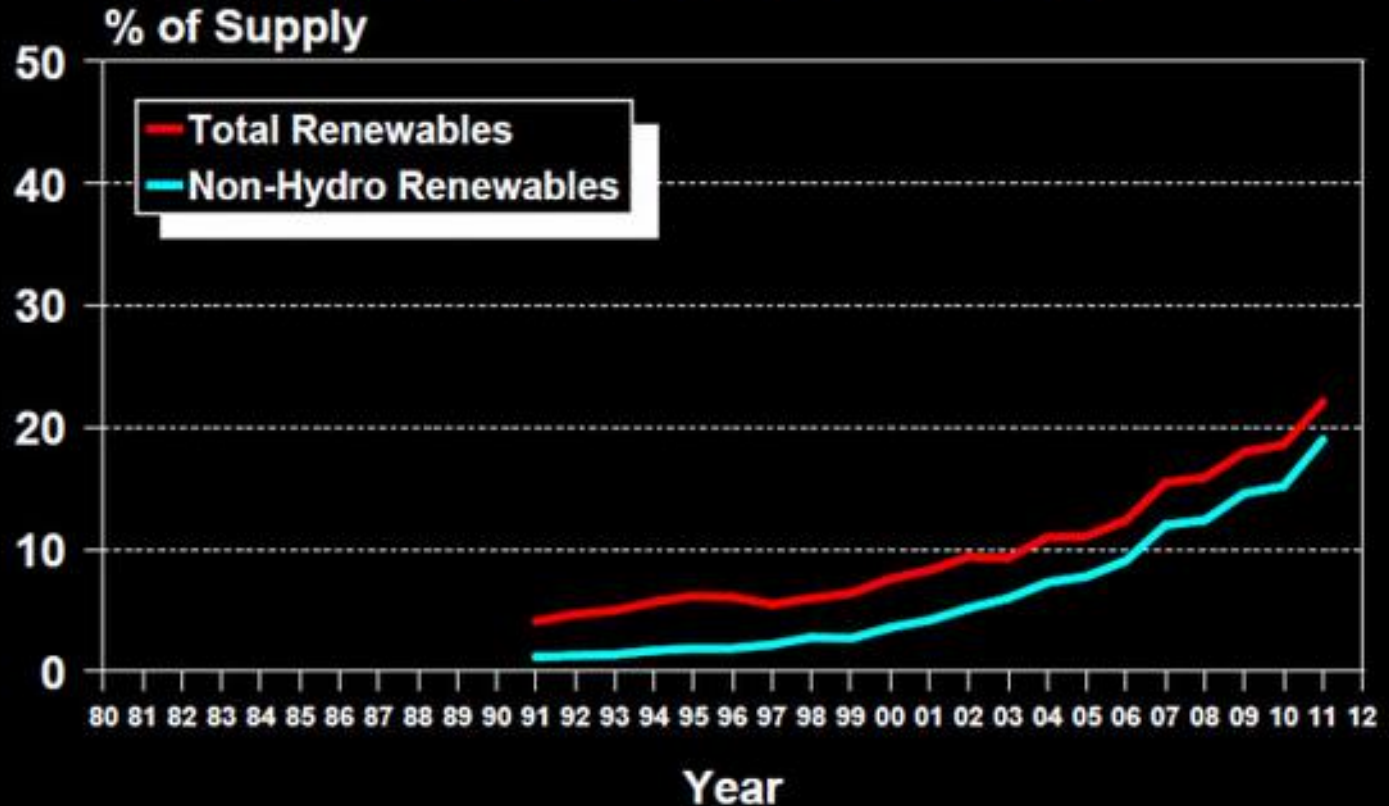


Denmark district heating



Germany

Germany Total & Non-Hydro Renewable Generation 1980-2011

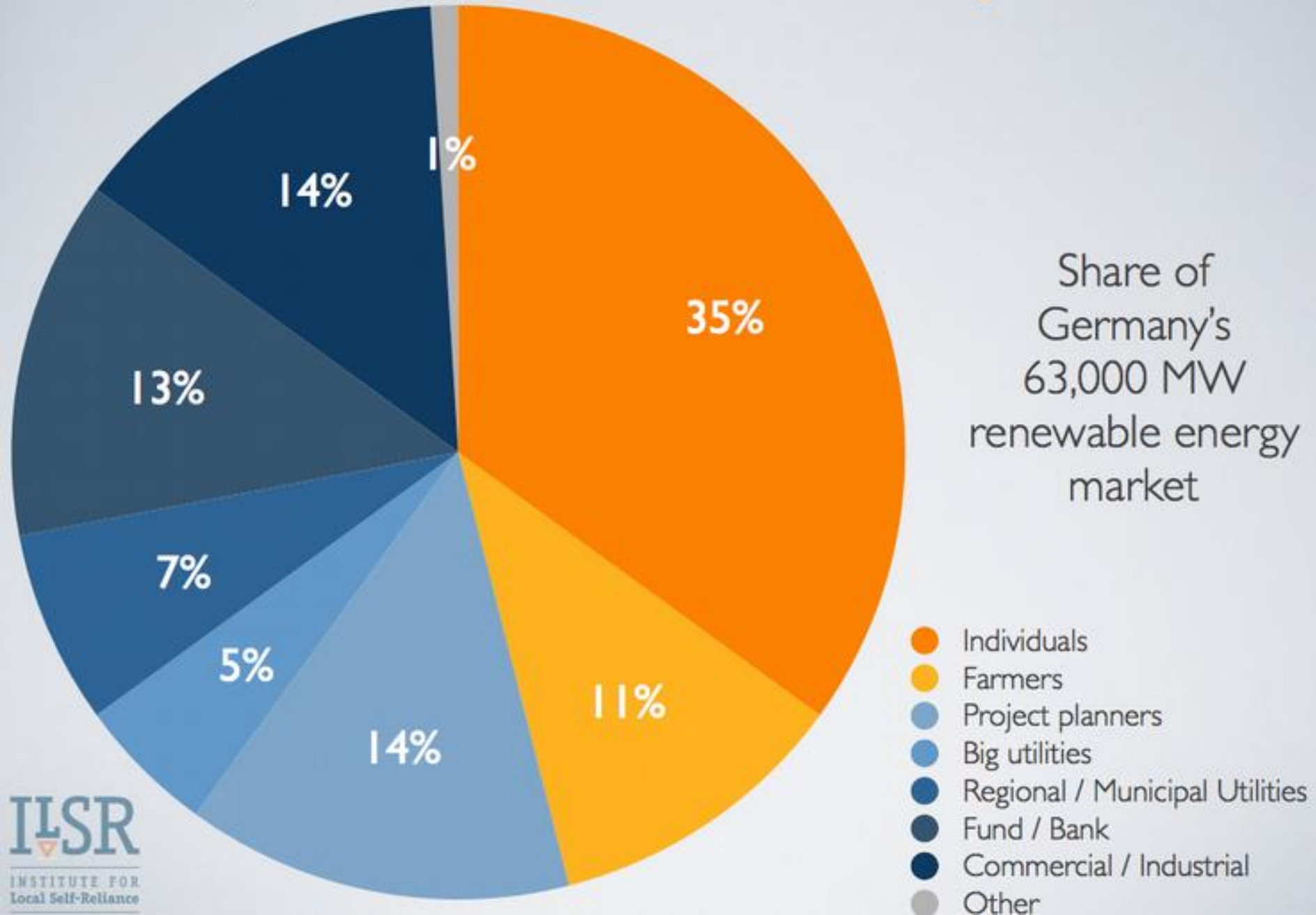


2014 - 28% of Electricity from Renewable Energy

Germany

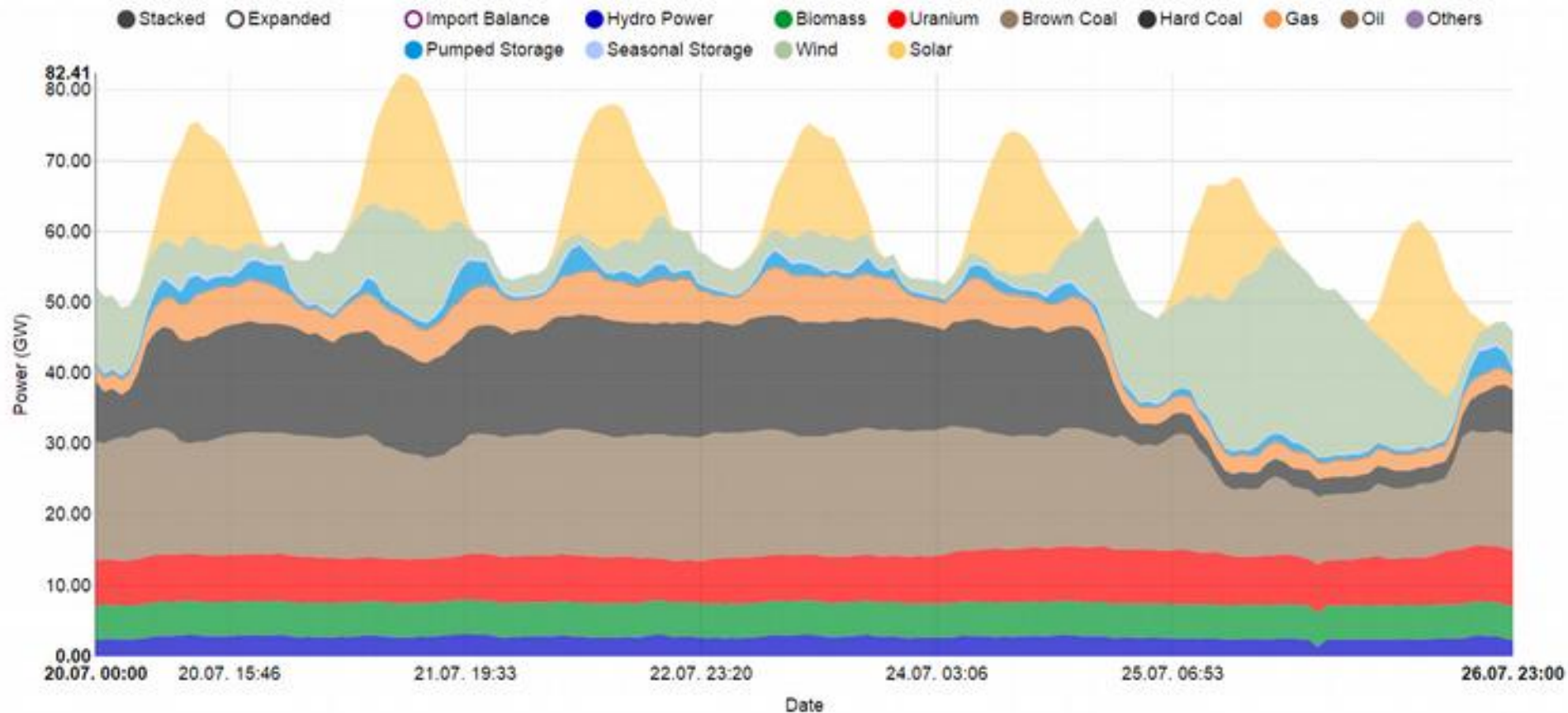


Germany's Energy Revolution Still **People Powered**



Germany

Electricity production in Germany in week 30 2015



last update: 28 Jul 2015 13:18

U.S.A.





U.S.A.

100% renewable

U.S.A.

Community Choice Aggregation (CCA) in the USA

2

Boulder

671

250

4

26

37

Fossil Fuels

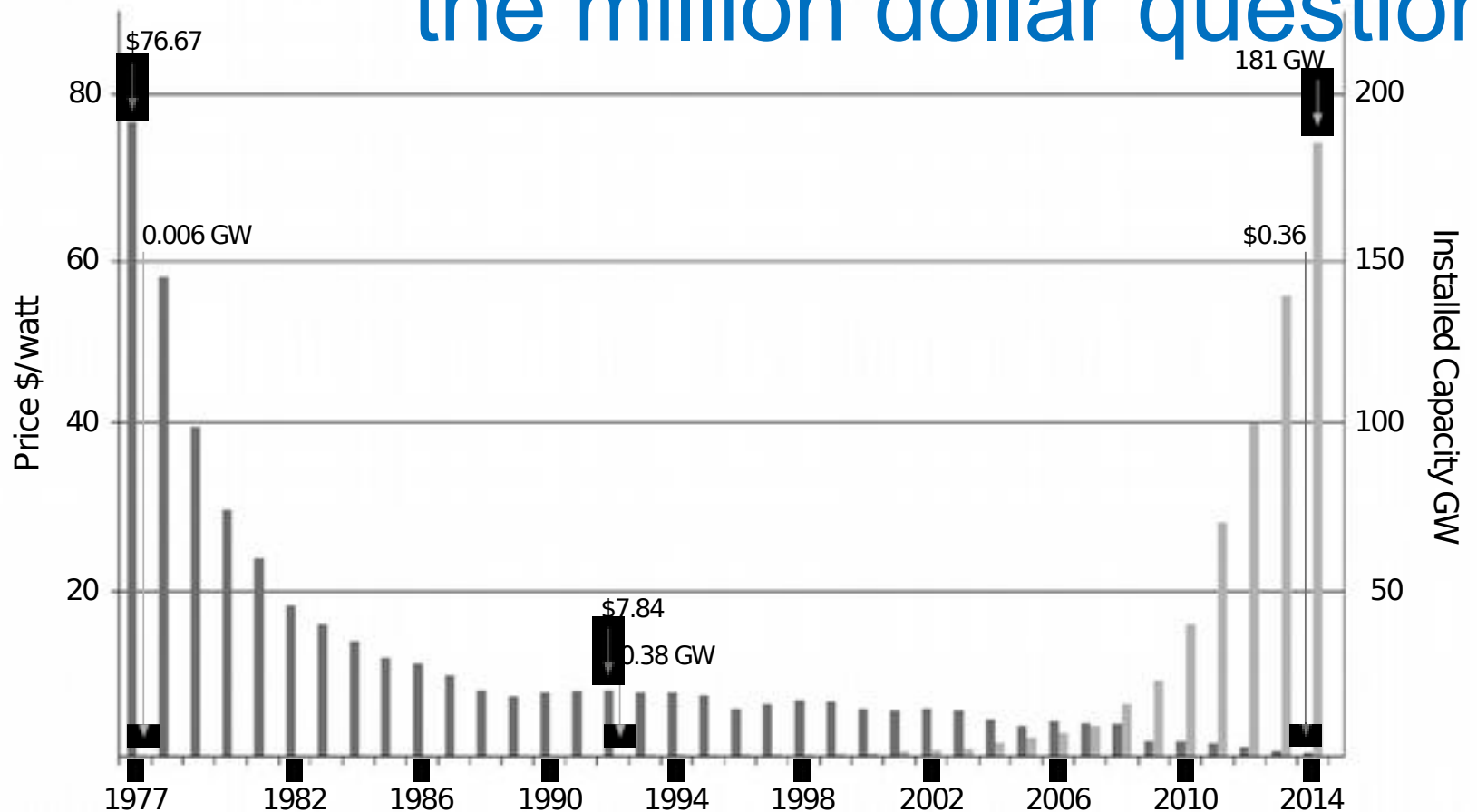
Mixed Sources

Green Energy

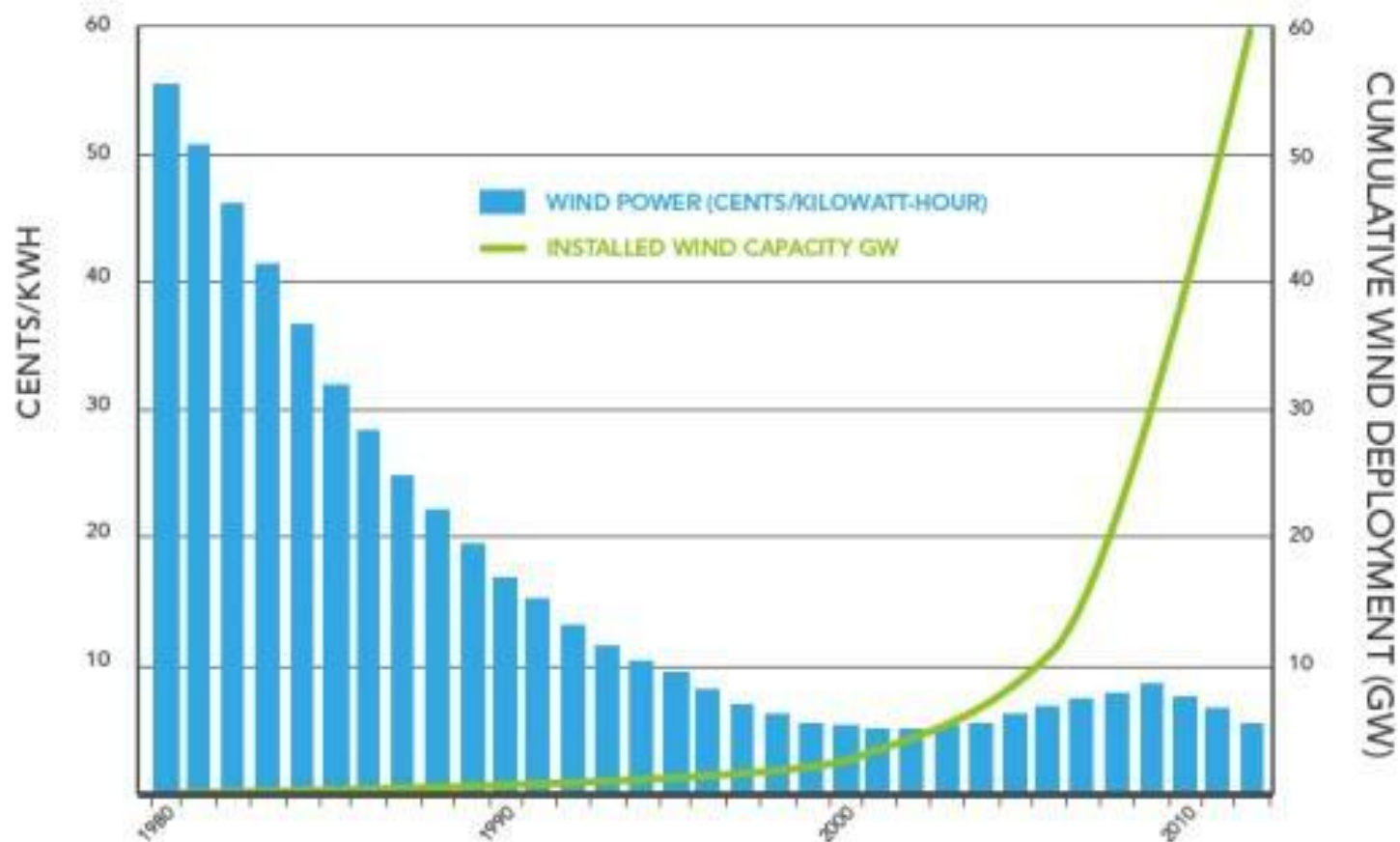
States with CCA
California
Illinois
Ohio
New Jersey
Rhode Island
Massachusetts

Photovoltaic Price and Installed Capacity

the million dollar question



Deployment and Cost for U.S. Land-Based Wind 2008-2012





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Chill Wind Blows Over Turkey



Let Me Not See Old Age in China

MARKETS | March 25, 2013, 4:34 a.m. ET

Utilities Facing a 'Mortal Threat' From Solar

Article

Video

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MORE IN MARKETS



By YULIYA CHERNOVA

Traditional transmission and distribution utilities will have to deal with distributed solar power, and it won't be a pretty fight, according to David Crane, president and chief executive of [NRG Energy](#) **NRG -1.96%** NRG +0.19%, a large independent power producer.



Utilities "do realize that distributed solar is a mortal threat to their business," said Mr. Crane, speaking at The Wall Street Journal's ECO nomics conference on Thursday in Santa Barbara, Calif.

"They can't cut costs, so they will try to distribute costs over power and power

Time to Take
STOCK
of Investor Behavior

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Africa



Africa



Africa

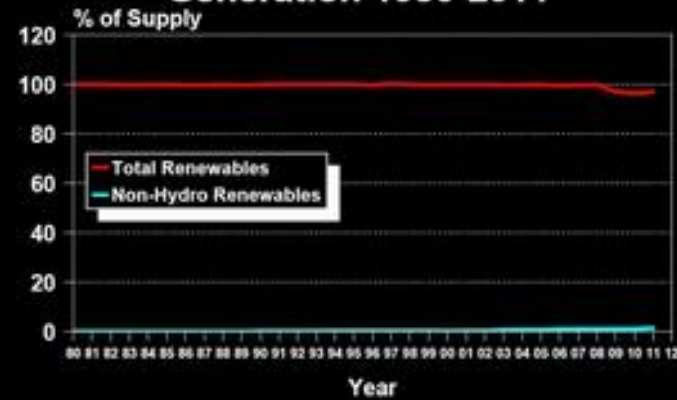


Bangladesh



Norway - 100% renewable

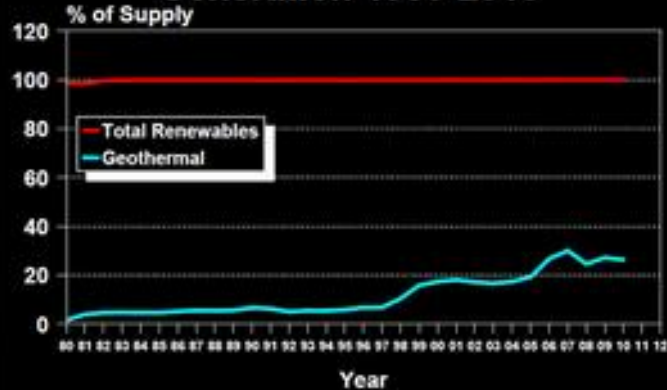
**Norway Total & Non-Hydro Renewable
Generation 1980-2011**



Iceland – 100% renewable



**Iceland Total & Non-Hydro Renewable
Generation 1980-2010**



Solar subsidy cuts legally flawed, high court rules

The government's decision to slash feed-in tariff incentives for solar installations breached rules governing consultation exercises

John Vidal

guardian.co.uk, Wednesday 21 December 2011 16:46 GMT
Article history



The high court has upheld a challenge against the government's plans to slash solar subsidies. Photograph: Realimagery.com

Government plans to slash incentive payments for householders who install solar panels were on Wednesday ruled "legally flawed" by a high

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A black week for green energy

The boast that the coalition would be "the greenest government ever" came to a sad end last month. Its death

can be dated precisely to the declaration by George Osborne, the Chancellor of the Exchequer, at the Conservative annual conference that Britain would cut carbon

desire to show leadership and Mr Osborne's determination that the Government should not become carried away with expensive gestures. This newspaper had hoped, in the dying days of Tony Blair's premiership, that Britain had opted for the role of green leadership. It was David Miliband's idea, when he was Mr Huhne's predecessor, that this country should set a green

to all that with his conference speech. "We're not going to save the planet by putting our country out of business," he said, which suggests that Britain cannot afford the luxury of green fripperies in hard times. Of course, we accept, and Mr Huhne accepts, that green prices have to be set at the right level. It would seem that the subsidy for solar power – the price

wind. The counter-argument is that the more that solar panels are made and installed, the cheaper they become and the greater the incentive for firms to invent cheaper technologies. Ernst & Young consultants predict, for example, that in the four years from 2009-2013 the price of installing panels will have more than halved. With the Fukushima disaster back on our screens

igners, solar power firms and housing associations have written to the PM, calling to ditch the plan. Those who signed it Tory MP Rebecca Harris, Green MP is Lucas, more than a dozen housing associations, the Solar Trade Association and energy firm Savills.

Mr Harris says: "The scheme has proven the potential of renewable energy to generate fuel poverty in some of the UK's poorest households."

But in state subsidies for "feed-in" tariffs will cost up to 30,000 jobs – and make a mockery of David Cameron's boast he would lead "the greenest government ever". Shadow Energy Minister Caroline Flint said: "This means thousands of lost jobs in regions already hit hard when the country is desperate for growth."

Feed-in tariffs let homeowners or landlords sell back to the national grid excess energy from solar panels on their properties. The policy helped these developments, using estate in Aspley, Nottingham, more than 600 householders have solar panels.

Now a scheme to put solar panels on roofs in mid-Wales has already been ditched and similar plans for 3,000 homes are in doubt.

SOLAR SELLOUT



battle lines

Tories axe green power
100,000 homes are hit

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PLUG PULL
Solar panels in Aspley, Nottingham

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opportunity - the new story



Fuel POVERTY

new businesses for

BOB

Four business models:

- Generation business
- Supply Business
- ESCO Business
- Collective Purchasing
or “Aggregation”

location, location, location

it starts in your town

it starts with people



technology – what's your business?



Year	0	1	2	3	4	5	6	7	8	9
0.4%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
49	73	95	114	131	146	160	173	185	196	206
Profit/Loss										
6.00 p/kWh	298,381	304,617	310,978	317,467	324,087	330,838	337,725	344,750	351,914	
5.25 p/kWh	261,083	266,540	272,106	277,784	283,576	289,484	295,510	301,656	307,925	
0.50 p/kWh	24,865	25,385	25,915	26,456	27,007	27,570	28,144	28,729	29,326	
Income	584,329	596,541	608,999	621,707	634,670	647,892	661,379	675,135	689,165	
5,808,994	290,450	290,450	290,450	290,450	290,450	290,450	290,450	290,450	290,450	
4,338,994	9,996	10,246	10,502	10,765	11,034	11,310	11,592	11,882	12,179	
2.00	59,976	61,475	62,008	63,058	64,135	65,238	66,369	67,528	68,717	
12.00	13,889	14,236	14,592	14,957	15,331	15,714	16,107	16,510	16,922	
13,889.00	25,000	25,625	26,266	26,922	27,595	28,285	28,992	29,717	30,460	
25,000	0	0	0	0	0	0	0	0	0	
-	45,000	46,125	47,278	48,460	49,672	50,913	52,186	53,491	54,828	
45,000	5,000	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	
5,000	Operating and admin costs	158,861	160,270	161,723	163,224	164,775	166,376	168,027	169,728	
	Expenditure (including depreciation)	449,311	450,720	452,129	453,538	454,947	456,356	457,765	459,174	
	Operating surplus	135,018	145,821	156,876	168,173	179,723	191,527	203,585	215,991	
1.00%	Interest on cash in bank	0	1,454	3,740	5,984	8,287	10,649	13,070	15,550	
£1,500,000	loan A interest	-105,000	-100,822	-96,351	-91,567	-86,448	-80,971	-75,110	-68,840	
£0	loan B interest	0	0	0	0	0	0	0	0	
	annual surplus before interest payments	0	-15,018	-31,079	-46,907	-62,412	-77,593	-92,451	-106,986	
	accumulated surplus	0	-15,018	-46,097	-113,004	-195,630	-287,648	-389,159	-499,174	
	Interest to members (losses carried forward)	0	-15,018	-31,079	-46,907	-62,412	-77,593	-92,451	-106,986	
	Surplus for distribution	15,000	15,375	15,759	16,153	16,557	16,971	17,395	17,830	
Oct 15	Cashflow									
Mar 16	Bank opening balance	30,000	260,758	487,337	20,000	20,000	20,000	20,000	20,000	
Apr 17	Capital expenditure	-5,808,994								
Sep 16	Surplus for distribution	15,000	15,375	15,759	16,153	16,557	16,971	17,395	17,830	
Dec 16	Add back depreciation	290,450	290,450	290,450	290,450	290,450	290,450	290,450	290,450	
	loan A capital	-59,692	-63,870	-68,341	-73,125	-78,244	-83,721	-89,582	-95,852	
	loan B capital	0	0	0	0	0	0	0	0	
	Community fund	-15,000	-15,375	-15,759	-16,153	-16,557	-16,971	-17,395	-17,830	
	Share capital (preprint and recruitment)	0	0	680,445	212,224	212,225	206,720	200,868	194,502	
£15,000										
costings	projections	XIRR</								

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Harvey's depot could become a community-owned solar power station making it one of the first in the south country. A solar panel would be installed on the roof of the building.



Solar power station plans for brewery

By AMIE MORRELL
amie.morrell@sussexpress.co.uk

REMARKABLE plans are in the pipeline to make Harvey's Brewery a community-owned solar power station.

Electricity would be generated from the roof of the Lewes-based brewery, which is a licensed and traditional brewery - as an MP.

The initiative of the project is being driven by Ringmer and Lewes-based specialist Ovesco Limited and a planning application has been submitted to Lewes District Council.

Ringmer-based installation specialists are looking to use the first solar power station at the brewery - and continue to build on Harvey's reputation as a community-owned enterprise.

The scheme would involve installing a 100kW solar panel array on the roof of the building, which would generate enough electricity to power the brewery's operations.

The two companies are now in discussion about the project's feasibility, which includes the costs of the solar panels and the electricity generated.

Mr. Jones said: "Ovesco are the experts and experts in the field and as a community enterprise we want to be part of such an initiative."

Harvey's will be a pioneer in the region and their own shared electricity is a very much a local value proposition, which is a licensed and traditional brewery - as an MP.

The scheme would involve installing a 100kW solar panel array on the roof of the building, which would generate enough electricity to power the brewery's operations.

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Mr. Jones said: "Ovesco are the experts and experts in the field and as a community enterprise we want to be part of such an initiative."

Under the proposal, the brewery would be able to supply its own electricity through Ovesco, which is a licensed and traditional brewery - as an MP.

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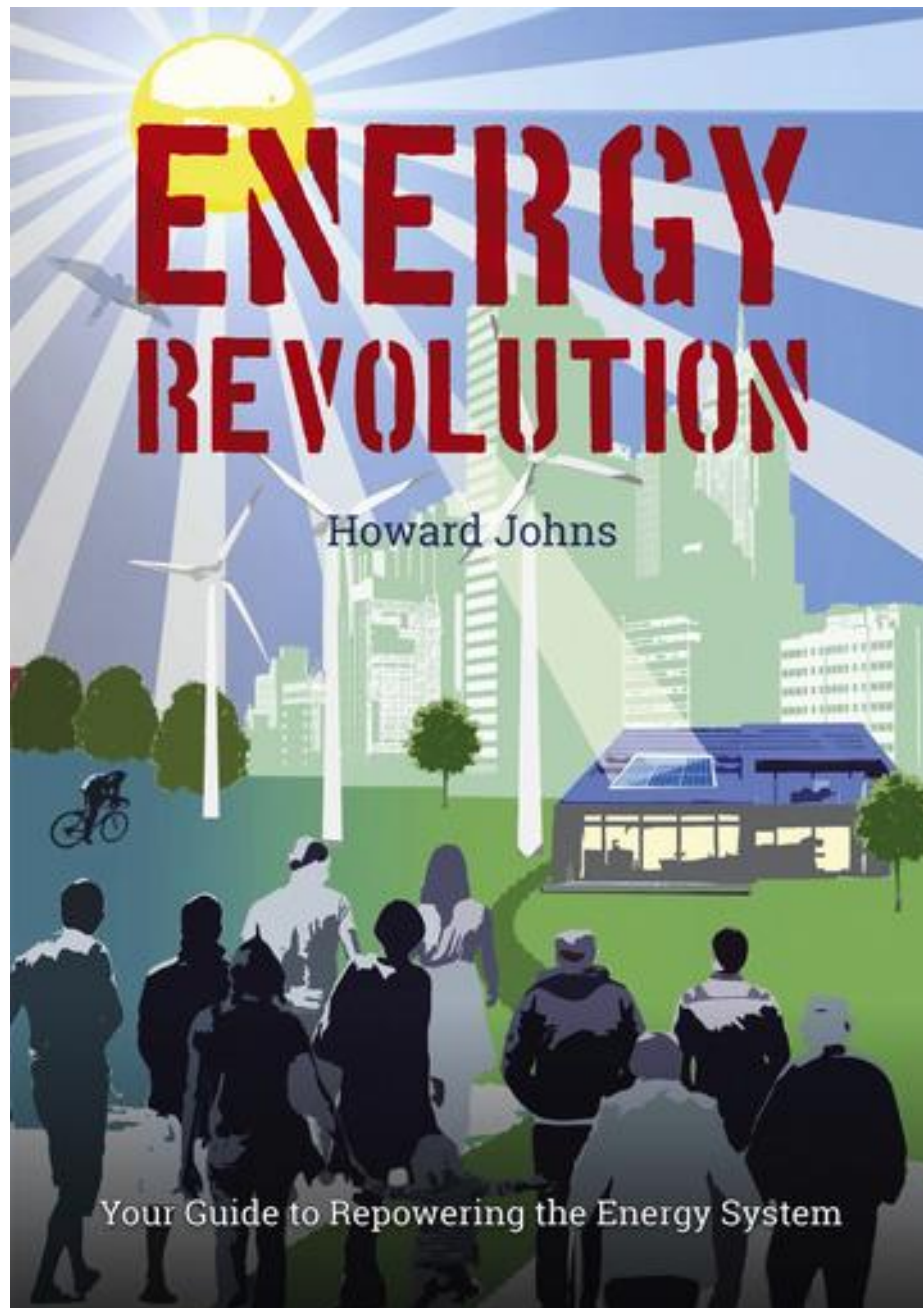
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Manage & start again





"Another world is not only possible, she is on her way. On a quiet day, I can hear her breathing." - Arundhati Roy

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