

# RENEWABLES – THE INVESTMENT CLIMATE

**IEA RIAB WORKSHOP, PARIS**

**ANGUS MCCRONE**

**27 MARCH 2012**



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1. Long-term climate for clean energy investment

2. Short-term weather patterns

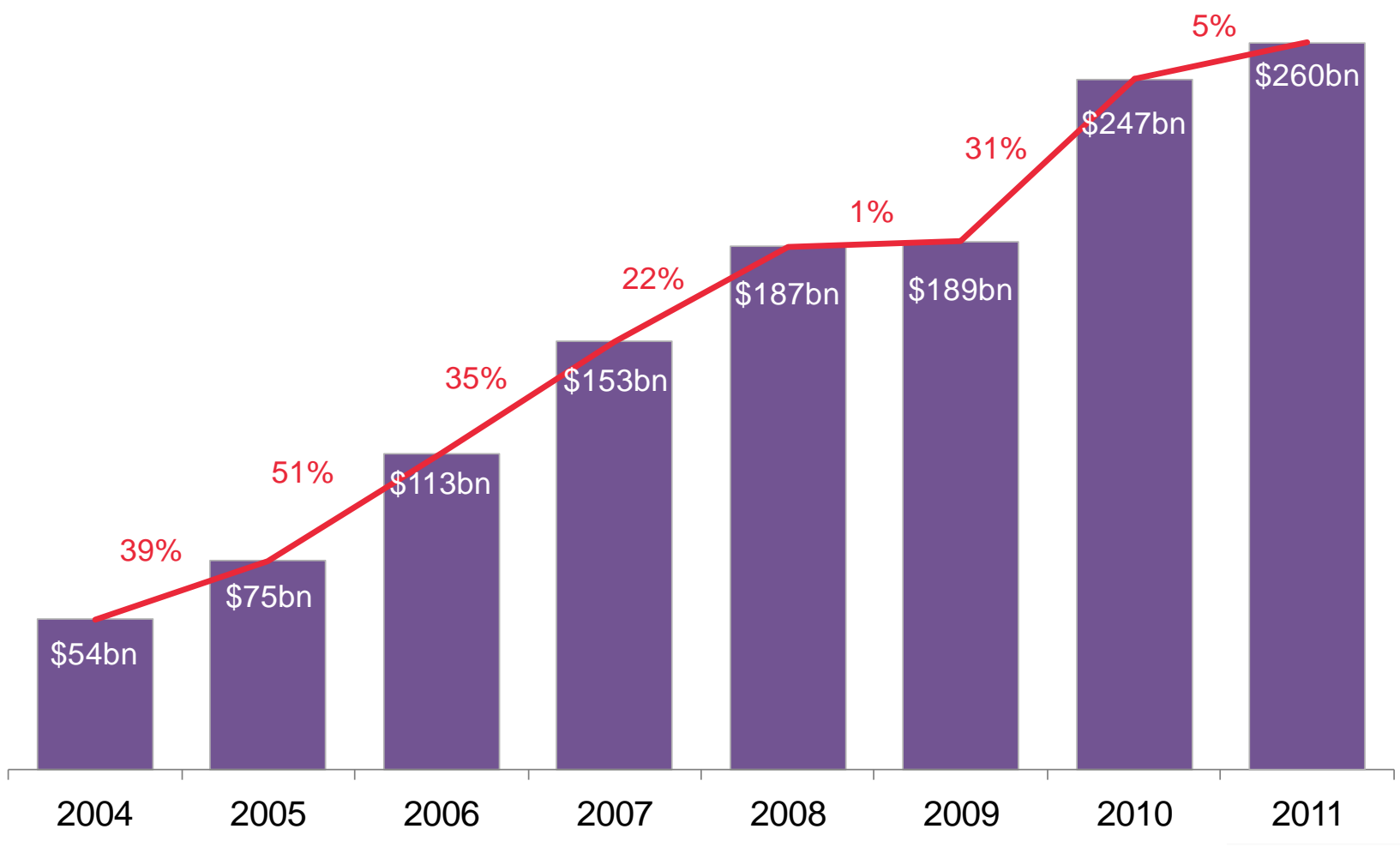
# LONG-TERM CLIMATE FOR CLEAN ENERGY INVESTMENT



Source: Wikimedia Commons

# GLOBAL TOTAL NEW INVESTMENT IN CLEAN ENERGY

2004–11 (\$BN)

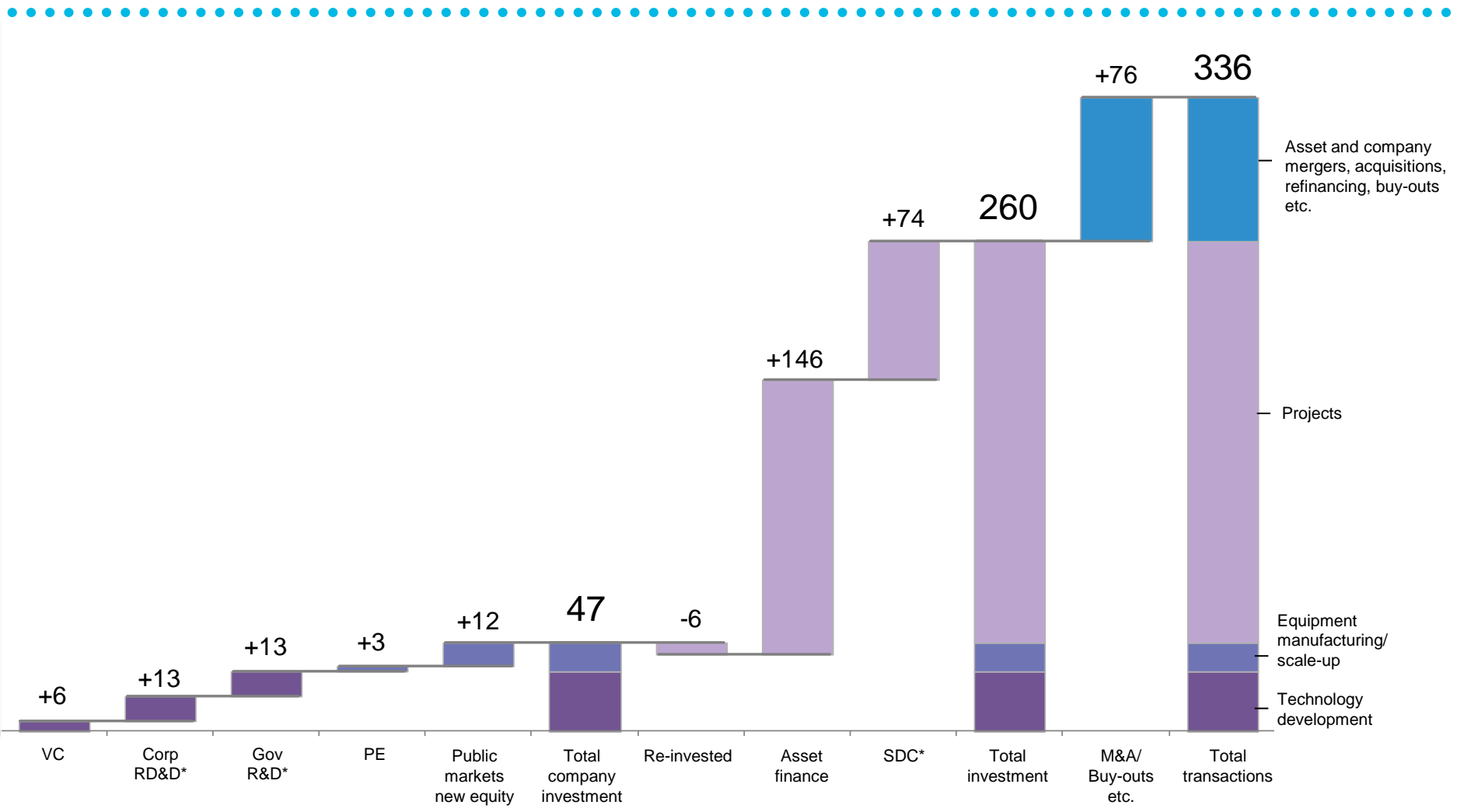


Note: Includes corporate and government R&D, and small distributed capacity. Adjusted for re-invested equity. Does not include proceeds from acquisition transactions

Source: Bloomberg New Energy Finance

# CLEAN ENERGY INVESTMENT TYPES & FLOWS

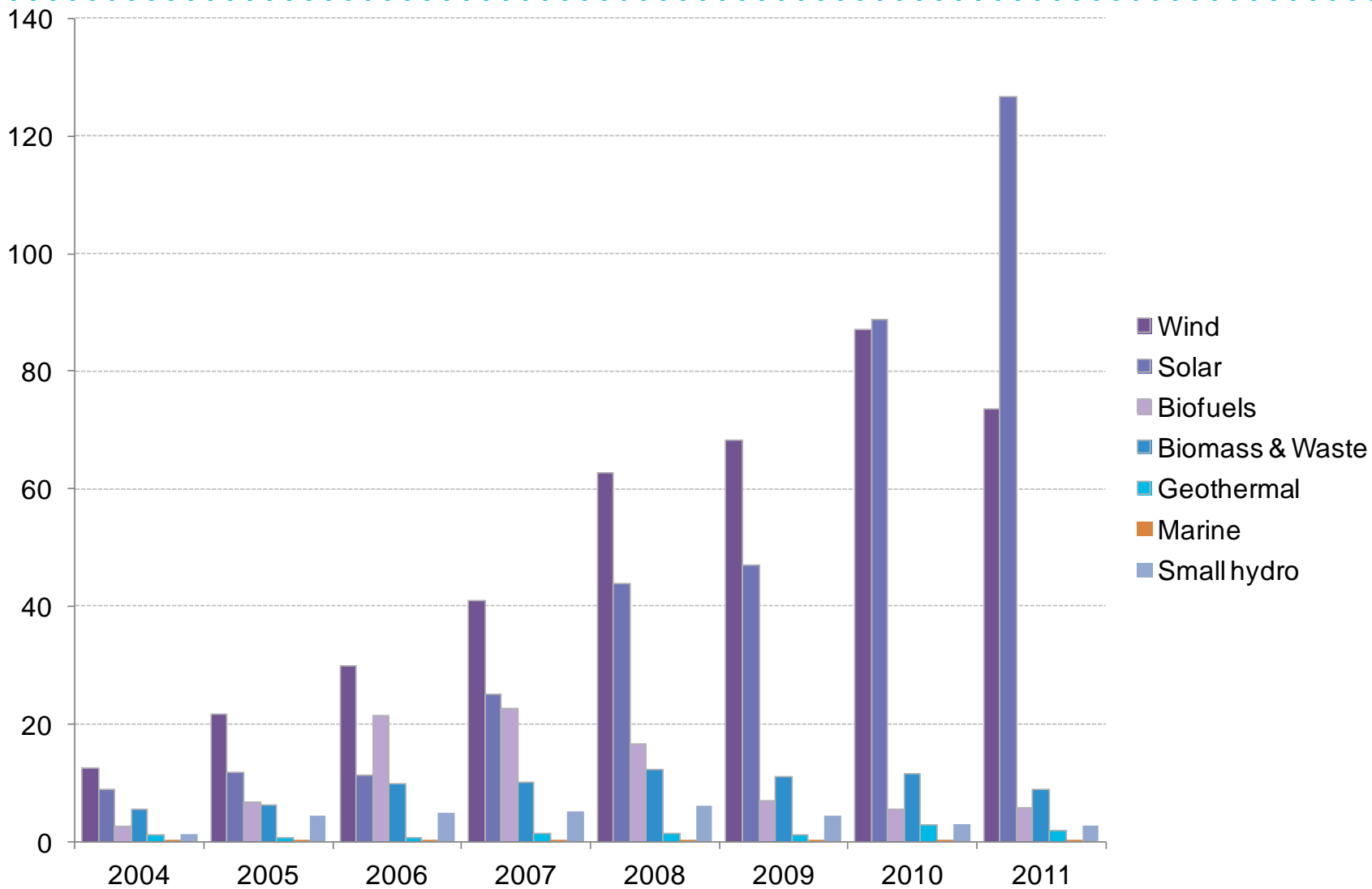
2011 (\$BN)



Note: Includes corporate and government R&D, and small distributed capacity. Adjusted for re-invested equity.

Source: Bloomberg New Energy Finance

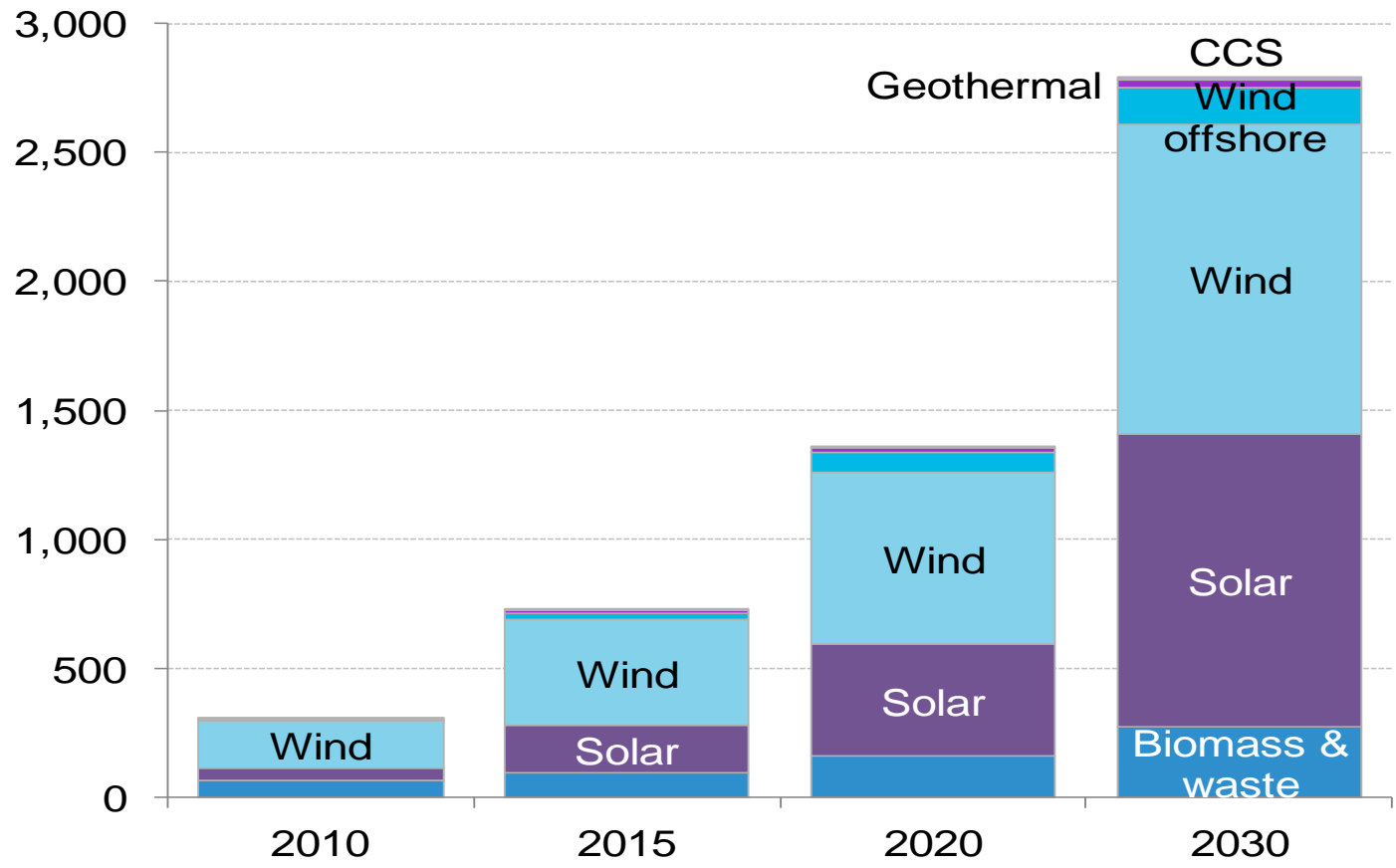
# CAPACITY INVESTMENT BY SECTOR, 2004–2011 (\$BN)



Source: Bloomberg New Energy Finance

# TOTAL INSTALLED CAPACITY BY TECHNOLOGY

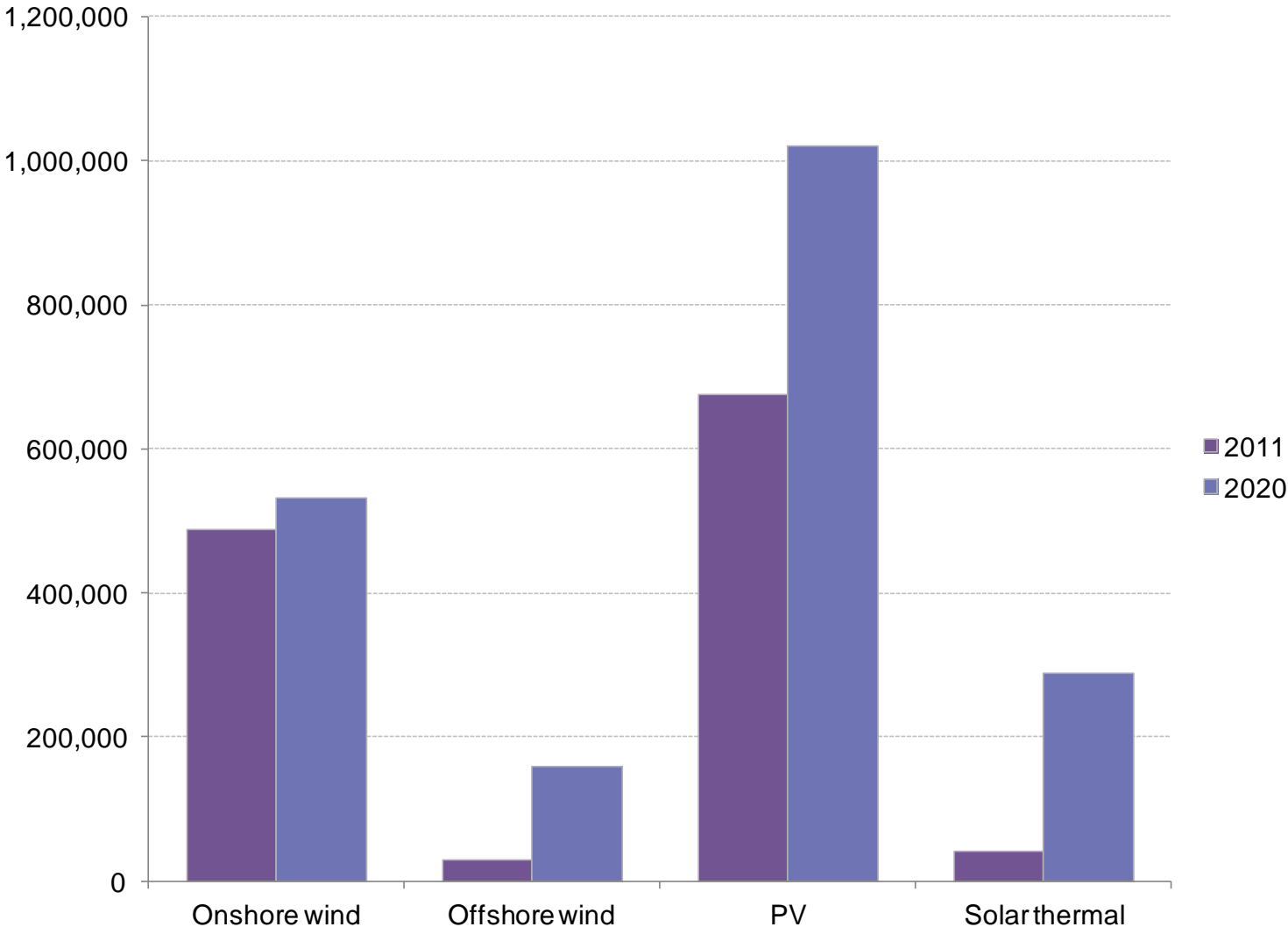
(GW)



Source: Bloomberg New Energy Finance

# EMPLOYMENT IN WIND AND SOLAR SECTORS

## WORLDWIDE, 2011 AND 2020



Source: Bloomberg New Energy Finance estimates



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# SHORT-TERM WEATHER PATTERNS

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Source: Wikimedia Commons

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# NEX INDEX, 2004–2012



Source: Bloomberg New Energy Finance

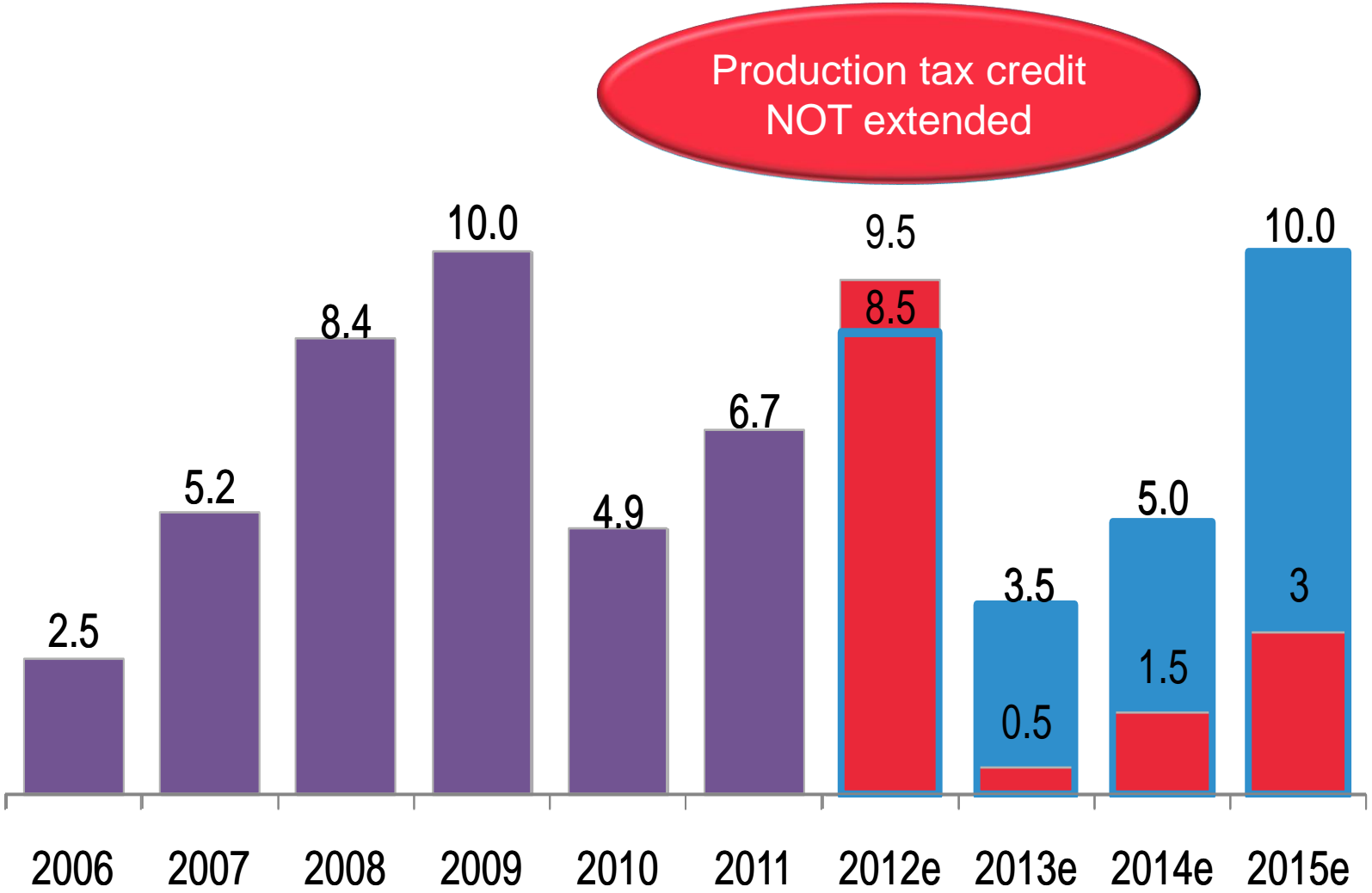
# NEX INDEX, 2004–2012



Source: Bloomberg New Energy Finance

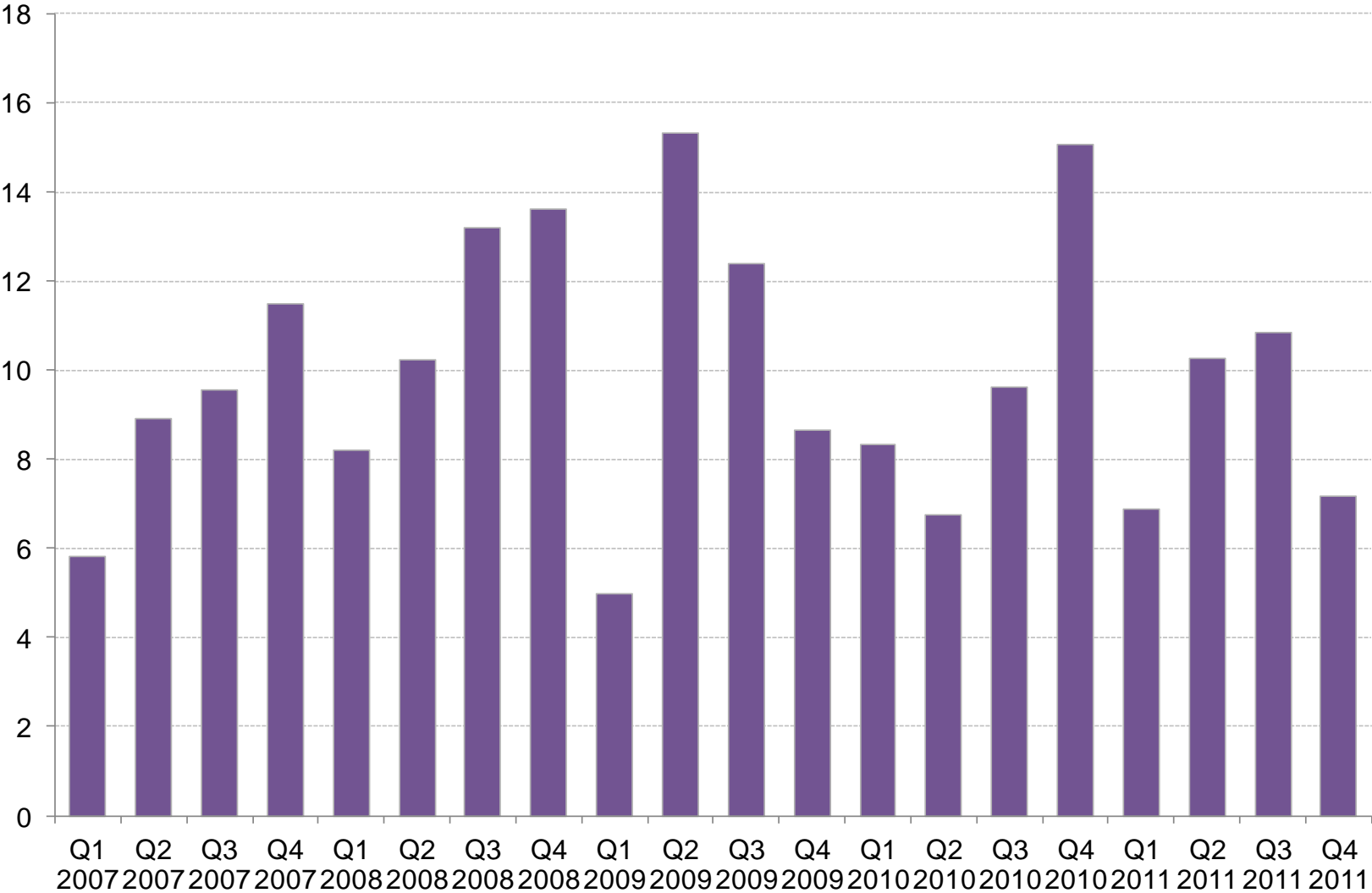
# US WIND CAPACITY ADDITIONS, 2008–15

(GW)



Source: Bloomberg New Energy Finance

# ASSET FINANCE OF UTILITY-SCALE PROJECTS IN EUROPE, Q1 2007-Q4 2011 (\$BN)



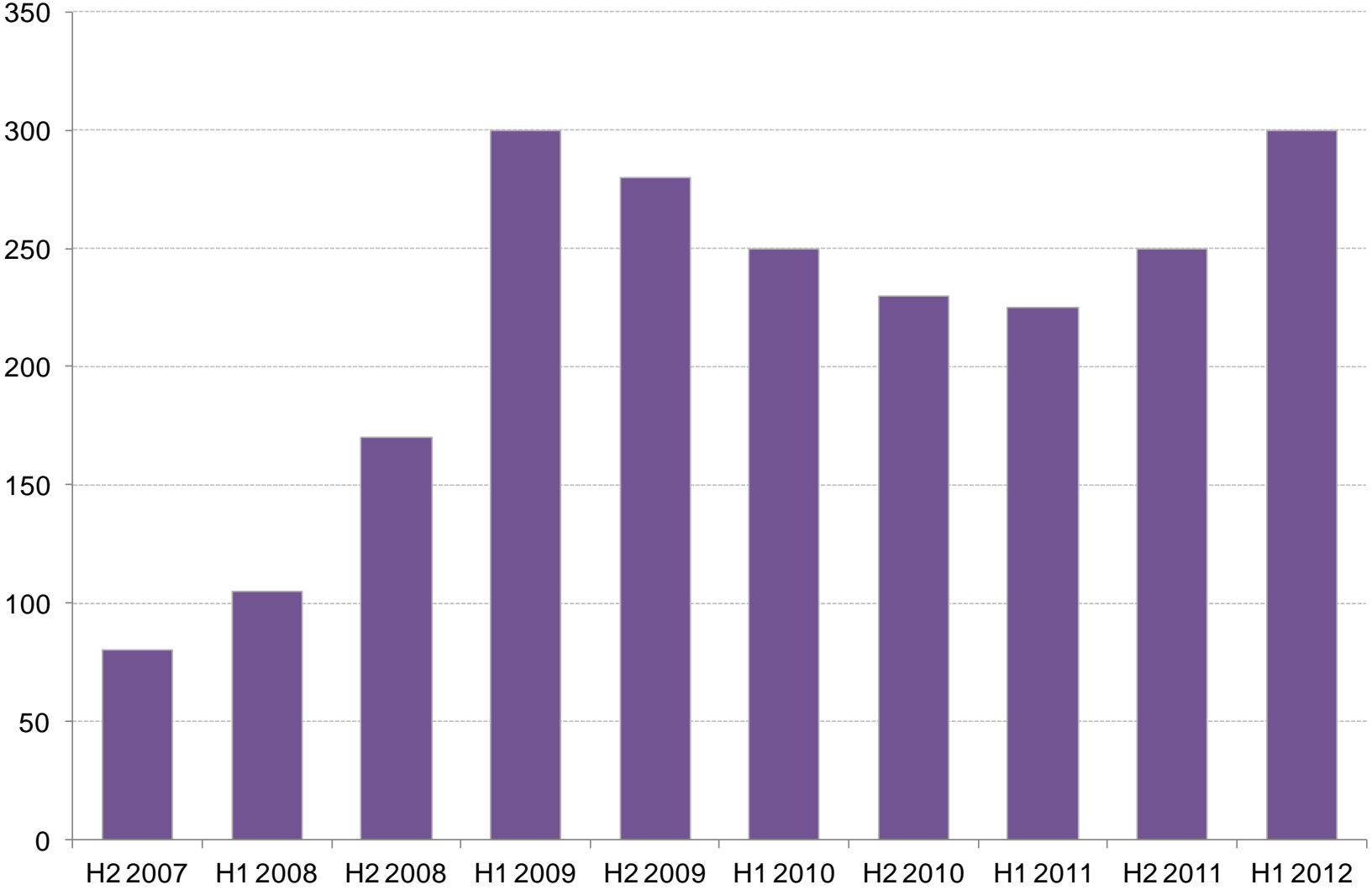
Source: Bloomberg New Energy Finance estimates

# 10-YEAR CREDIT DEFAULT SWAP PRICES FOR SELECTED EURO AREA BANKS, 2011-12 (BASIS POINTS)



Source: Bloomberg

# AVERAGE INITIAL SPREAD ON ONSHORE WIND PROJECT IN EUROPE, 2007–2012 (BASIS POINTS)

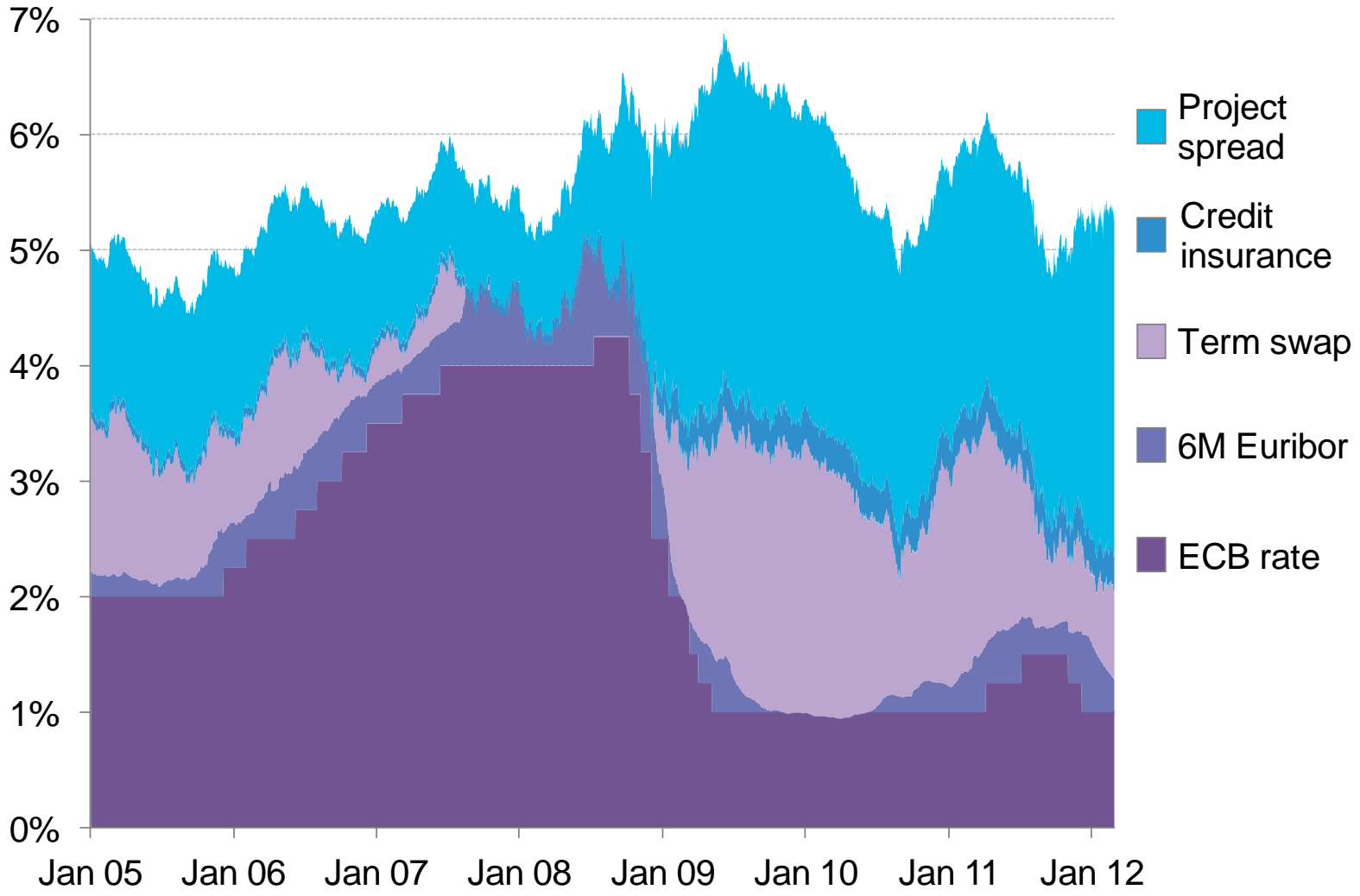


Note: H1 2012 figure is for Northern Europe only.

Source: Bloomberg New Energy Finance



# INITIAL COST OF DEBT FOR EUROPEAN ONSHORE WIND PROJECT



Note: Figures for last six months are for Northern Europe only.

Source: Bloomberg New Energy Finance

# MIGHT CLEAN ENERGY INVESTMENT TAKE A NAP?

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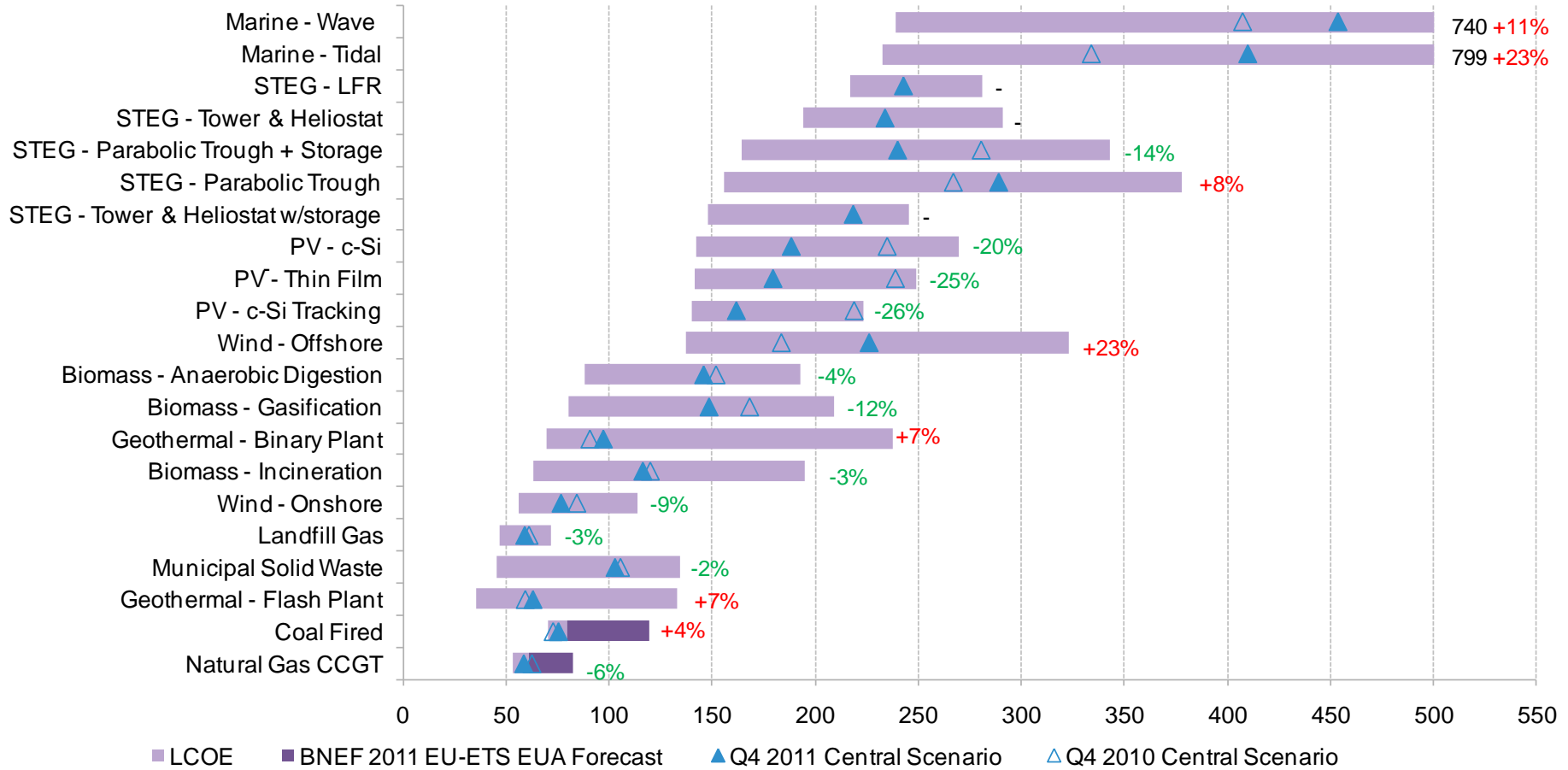
Source: Wikimedia Commons

# INVESTMENTS REQUIRED TO REALISE NREAP ROADMAPS, BY COUNTRY, 2011–20 (EURM)

Country	Geothermal	Hydro	Offshore Wind	Onshore Wind	Solar (PV)	STEG	Wave & Tidal	Biomass & Biogas	TOTAL
Austria		1,725	0	1,952	389		0	143	4,210
Belgium	11	72		4,287	1,661		0	3,701	9,733
Bulgaria	0	1,193		1,147	529		0	314	3,183
Cyprus	0	0		262	287	335	0	21	905
Czech Republic	14	96		611	86		0	575	1,383
Denmark		0	2,441	136	5		0	3,519	6,100
Estonia		212	915	338	0		0	0	1,465
Finland		88	5,261	1,042	16		54	0	6,460
<b>France</b>		<b>6,046</b>	<b>21,470</b>	<b>16,096</b>	<b>7,262</b>	<b>2,308</b>	<b>716</b>	<b>3,889</b>	<b>57,786</b>
Germany	170	1,595	35,534	10,508	63,990		0	4,752	116,550
Greece	907	1,563	1,093	7,185	3,561	1,041	0	363	15,713
Hungary		42	0	528	102		0	451	1,123
Ireland	378	0	1,858	2,411	0		350	156	5,154
Italy	100	3,276	2,442	7,582	9,991	2,402	14	3,400	29,208
Latvia	523	36	658	243	4		0	218	1,682
Lithuania		36	0	409	18		0	383	845
Luxembourg		156		122	155		0	146	578
Malta		0	354	18	49		0	40	461
Netherlands		406	17,946	4,952	619		0	2,938	26,861
Poland		480	1,780	5,503	4		0	4,103	11,870
Portugal		5,388	271	3,235	1,463	2,138	1,194	545	14,234
Romania		3,032	0	4,409	461		0	1,174	9,077
Slovakia	158	459	0	440	421		0	318	1,796
Slovenia	0	629	0	123	199		0	83	1,035
Spain	13	3,514	10,916	18,229	7,525	19,882	479	1,678	62,235
Sweden	0	22	377	3,141	5		0	475	4,020
<b>UK</b>	<b>158</b>	<b>1,114</b>	<b>41,678</b>	<b>13,148</b>	<b>4,380</b>		<b>6,263</b>	<b>5,268</b>	<b>72,009</b>
<b>TOTAL:</b>	<b>2,430</b>	<b>31,180</b>	<b>144,995</b>	<b>108,059</b>	<b>103,180</b>	<b>28,105</b>	<b>9,072</b>	<b>38,655</b>	<b>465,676</b>

Source: BNEF estimates, based on published NREAPs

# Q4 2011 LEVELISED COST OF ENERGY



Carbon forecasts from the BNEF European Carbon Model with a 2020 horizon \$89/tCO2. Coal and nat gas prices from the US Department of Energy EIA Annual Energy Outlook 2011. % change represents change in mid from Q4 2010

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# RENEWABLES – THE INVESTMENT CLIMATE

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Renewable Energy Certificates

Carbon Capture & Storage

Power

Water

Nuclear

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