



E.ON

success in power generation

**E.ON's Nuclear Fleet and
New Build Involvement in Europe**

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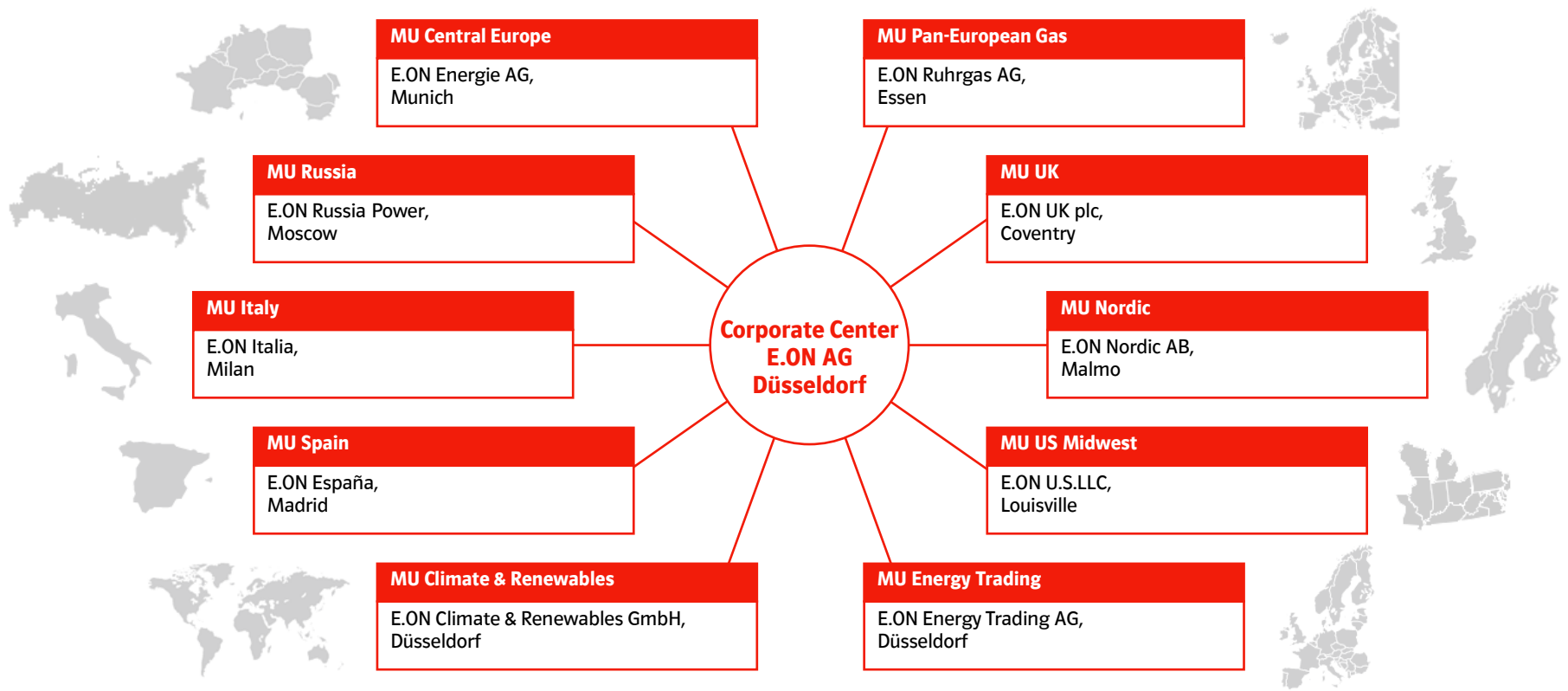
Senior Vice President: New Nuclear Development

Helsinki

5th November 2009

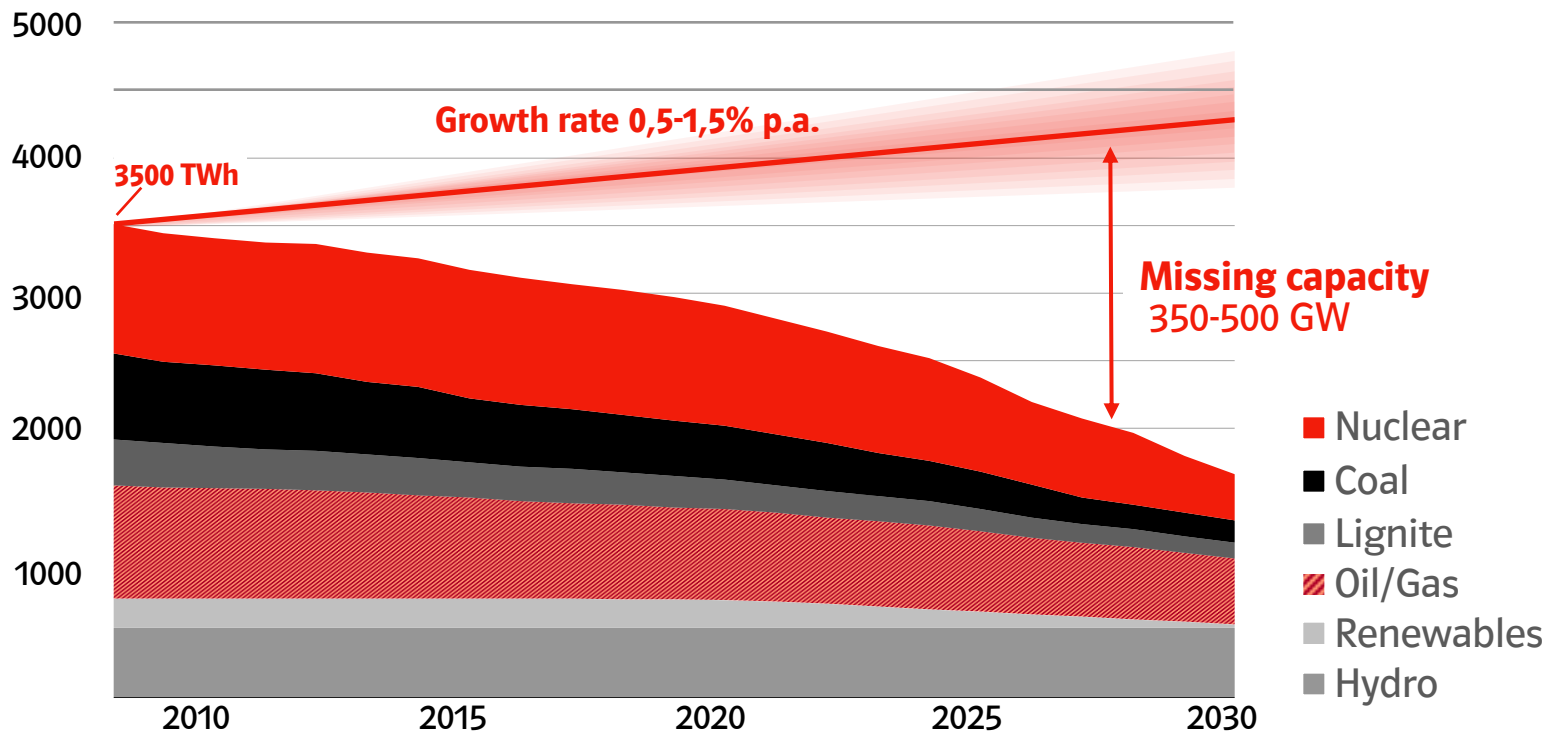
E.ON AG 2008

86,8 bn. € sales, 93.500 employees



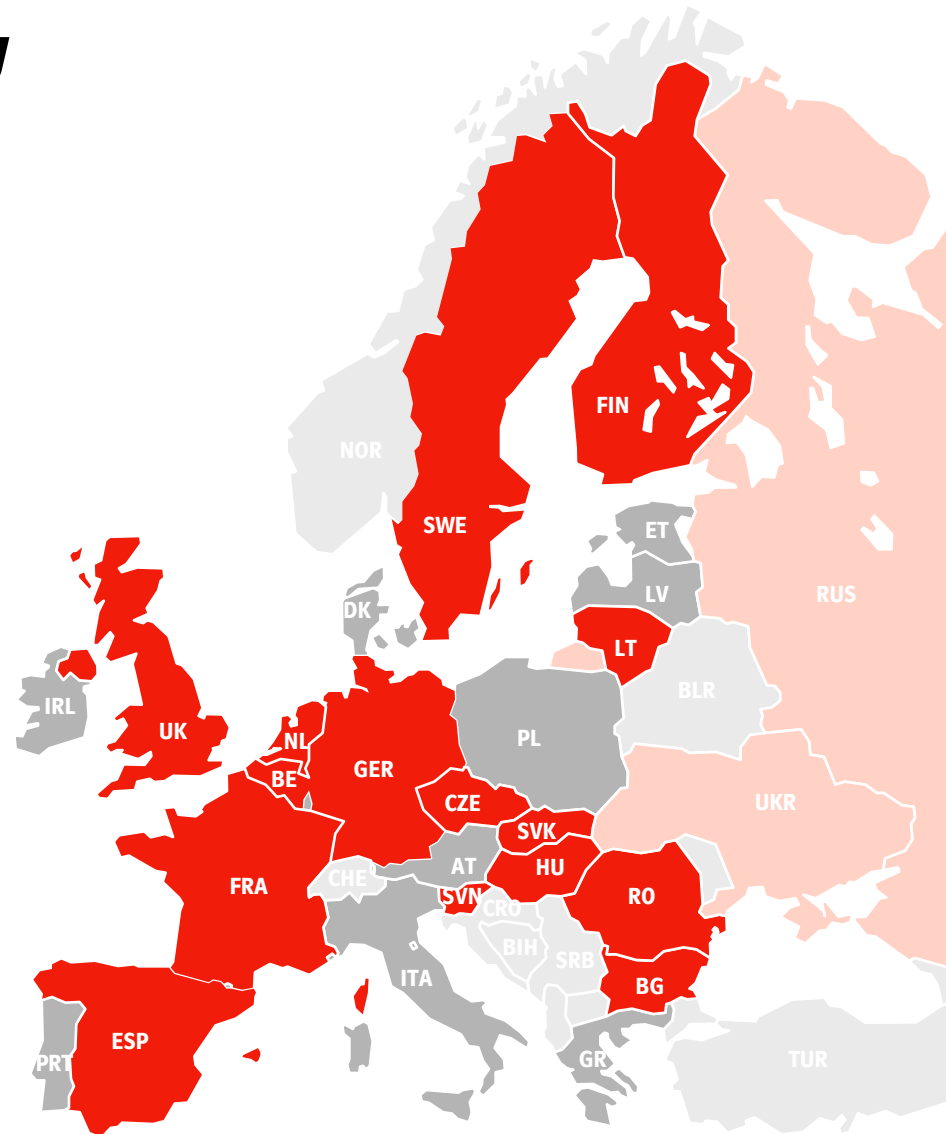
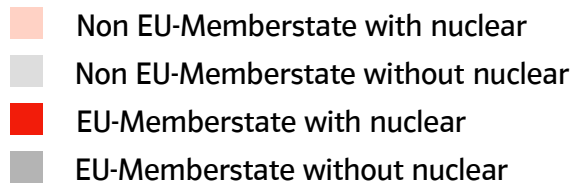
Europe: more than 50 % capacity will have to be replaced until 2030

Development of power capacities in Europe (EU-15) without New-Build

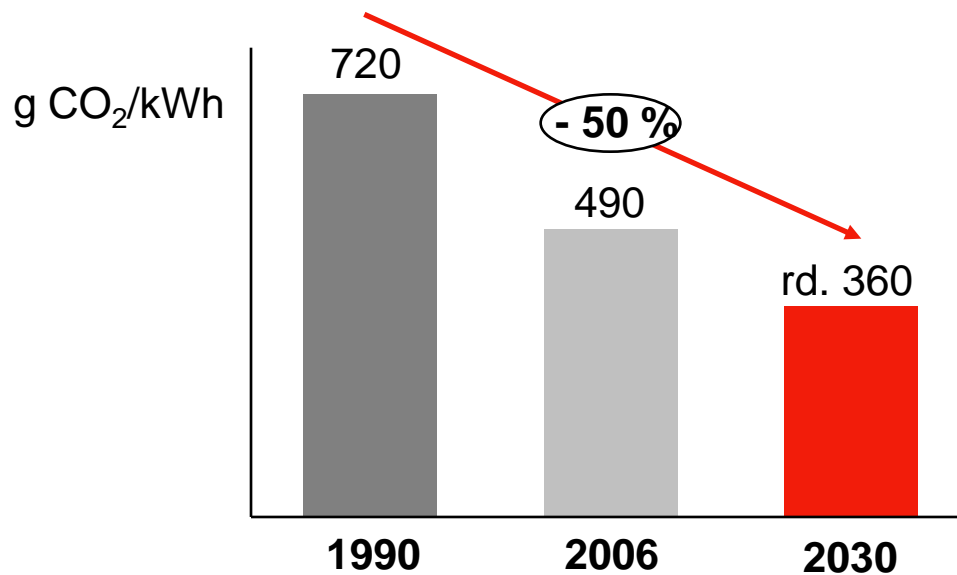


Europe relies on nuclear energy

- 71% of Europeans utilise nuclear energy
- 145 NPPs produce about 1/3 of the electricity needed in Europe



E.ON target to cut carbon emission by 50%

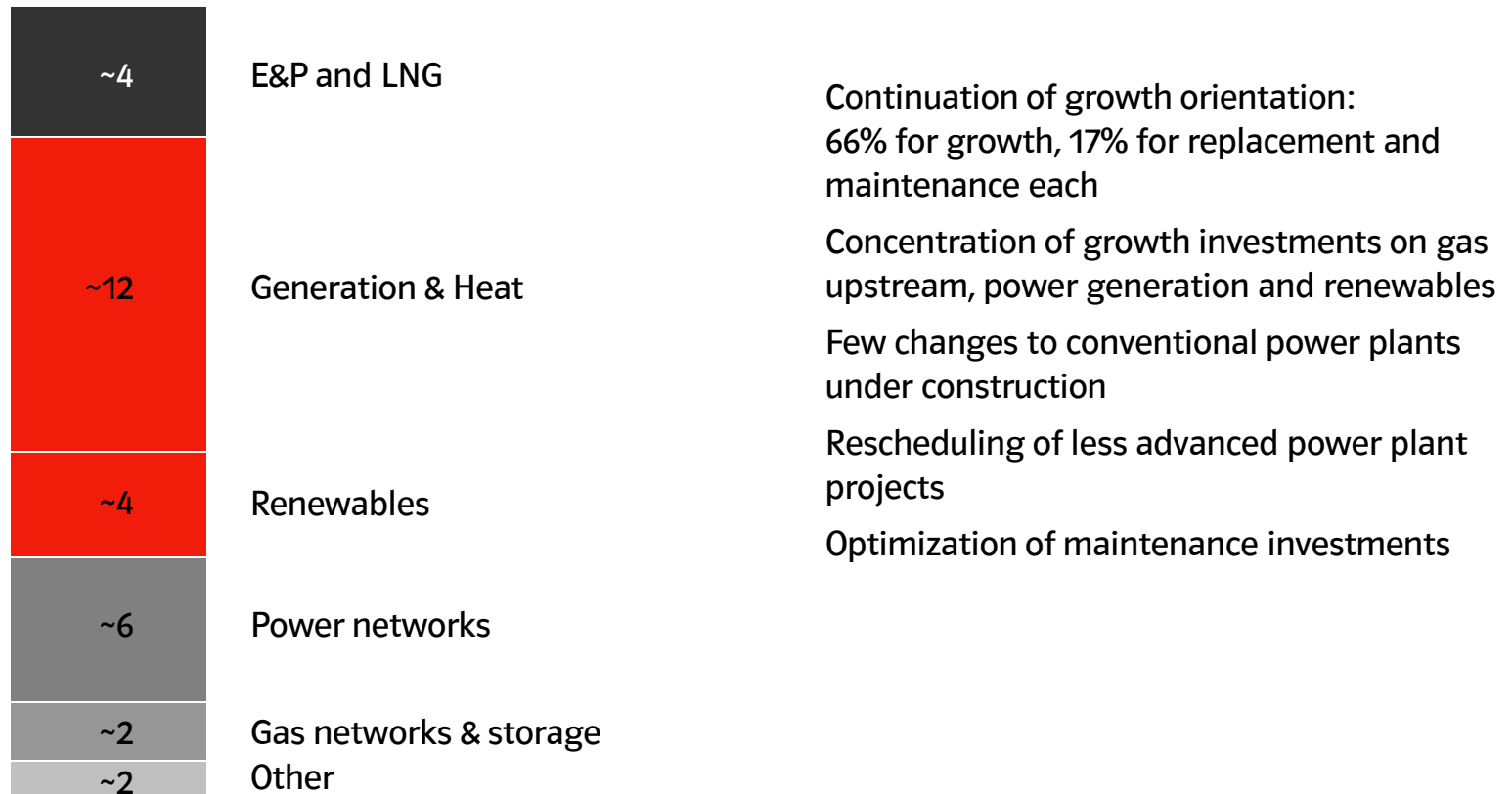


Carbon free generation plays an important role in E.ON portfolio

Acquisitions and new build program will deliver E.ON's carbon target

Priorities set for 2009-2011 investment plan

in billion €



Main focus on generation accompanied by gas upstream and renewables

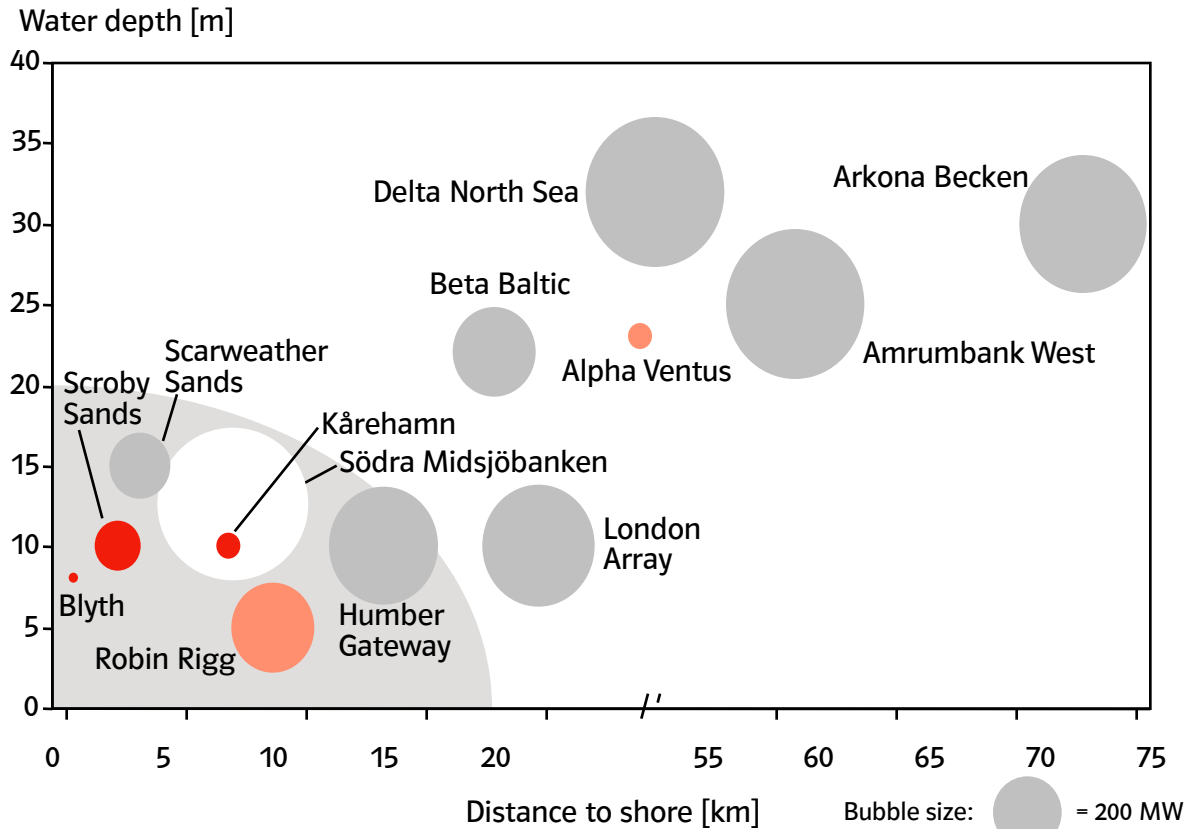
EC&R and offshore wind power: stepwise into deep Water



- **Offshore is an important part of EC&R-strategy**
- EC&R is world-wide leading in offshore wind power: within TOP3 regarding installed offshore capacity and regarding projects in the pipeline
- EC&R already gathered comprehensive offshore experiences in UK and Denmark, supporting the actual German projects:
 - Operation of three offshore wind farms (ca. 100 MW)
 - 400 MW under construction: Robin Rigg (UK), Rödsand 2 (DK)
 - Worldwide biggest offshore project in preparation: London Array in the UK (1.000 MW)
- In Germany EC&R is involved in the North Sea offshore-testfarm Alpha Ventus
- 4 more offshore projects in the German North and Baltic Seas with more than 1.300 MW in the pipeline (s. left), Realisation according to experiences gathered with Alpha Ventus

EC&R Offshore-Pipeline in Germany	Capacity
Alpha Ventus, North Sea	60 MW
Amrumbank West, North Sea	400 - 480 MW
Delta Nordsee, North Sea	400 - 480 MW
Arkona-Becken Südost, Baltic Sea	400 - 480 MW
Beta Baltic, Baltic Sea	150 MW

Mapping E.ON's wind offshore operating assets and projects in the pipeline

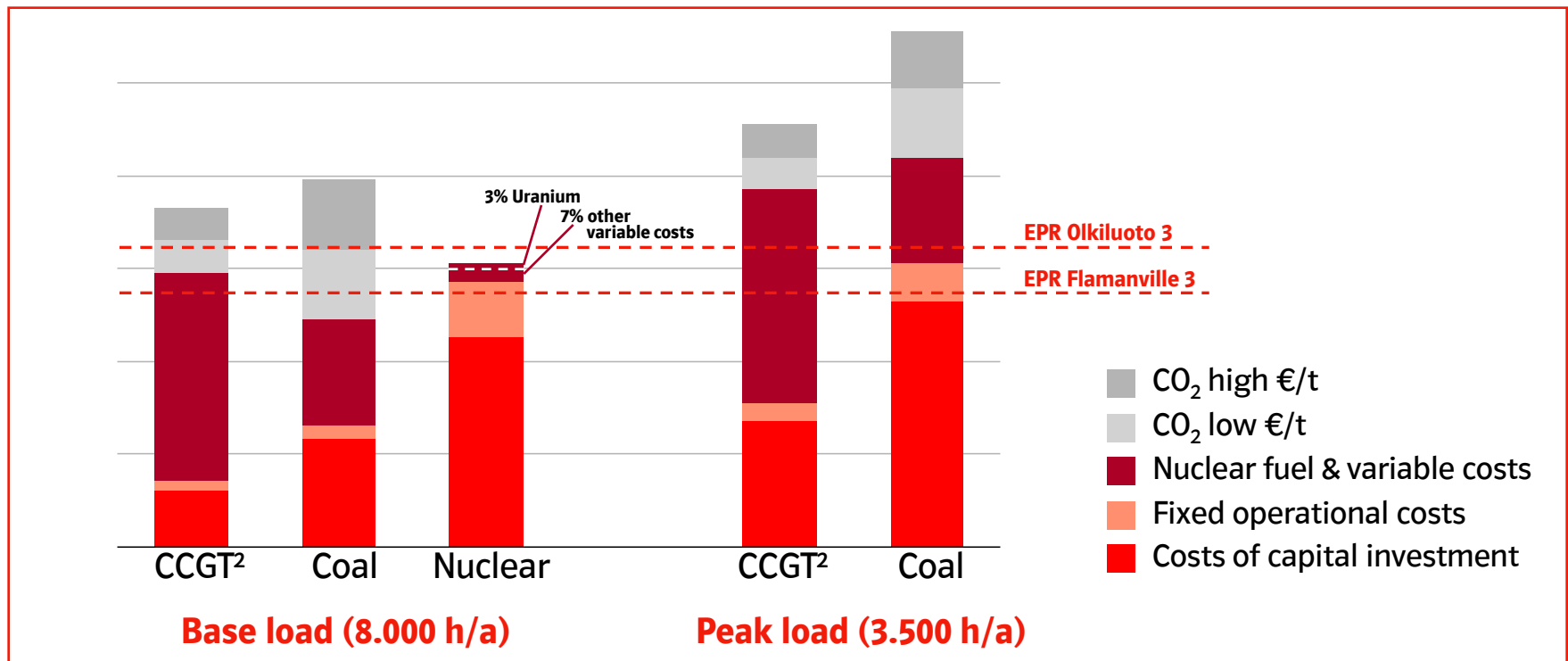


- In origination
- Under development
- Under construction
- In operation

Climate protection

CO₂ issue contributes to economics of nuclear power for base load

Long term new entry costs in Europe (Assumption)¹



Nowadays there are no other power plants besides Nuclear plants and Run of River plants that can reliably provide clean base load electricity

1. Investment costs and raw materials price based on E.ON estimates
 2. CCGT: Combined Cycle Gas Turbine (GuD)

E.ON Nuclear

21 units at operations (9 units operated by E.ON, 12 with minority shares)	
5 units shut down / at decommissioning	
Installed capacity	≈ 11 GW
Employees	≈ 3.300
Availability	> 90 %
Power generation	≈ 80 TWh

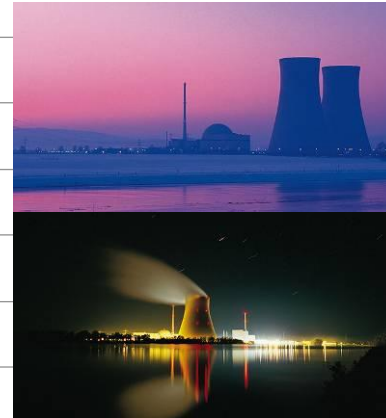
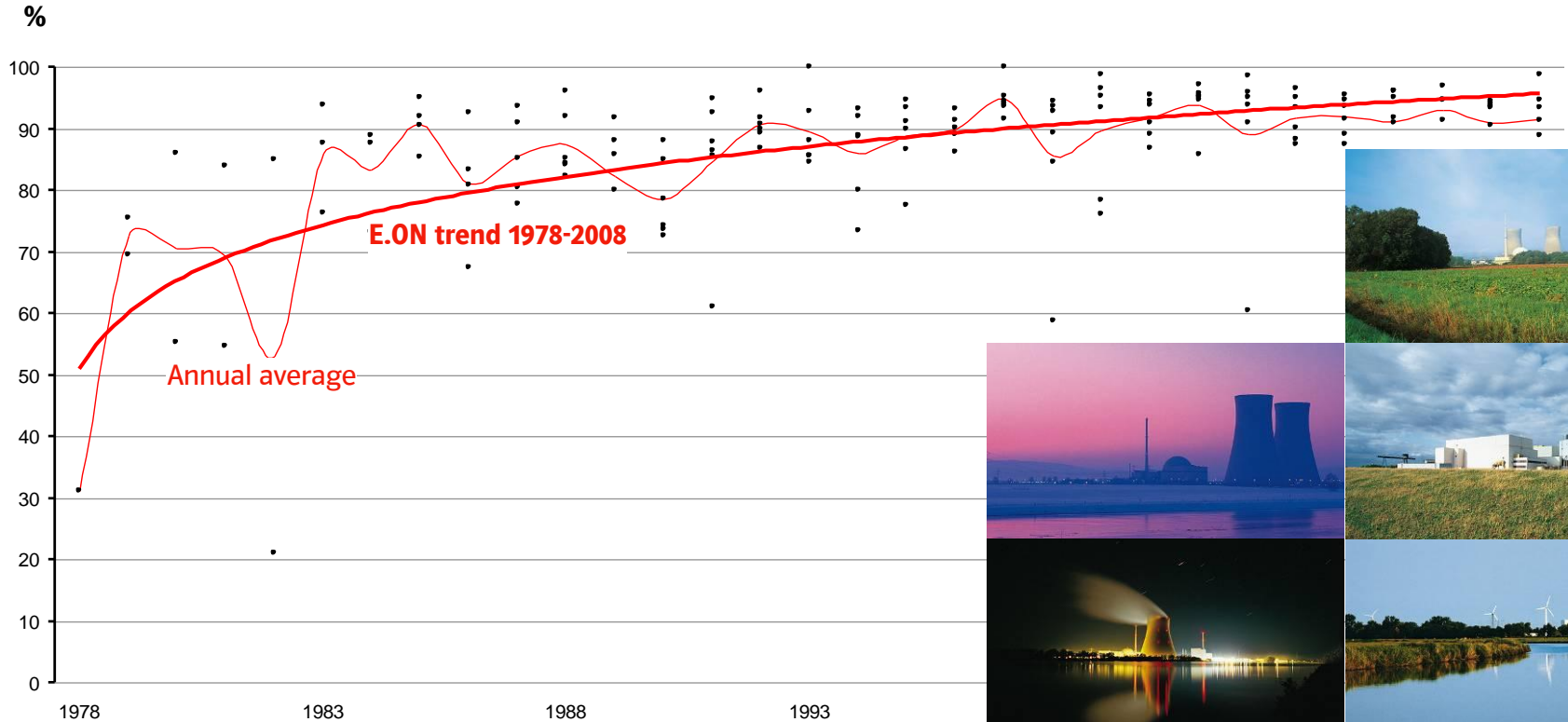
Other shares:

- **Uraium fuel supply - Urenco**
- **Waste management - GNS**



- E.ON head quarters
- Operated by E.ON
- NPPs minority shares
- NPPs under dismantling and decommissioning

Availabilities of power plants operated by E.ON Nuclear (EKK)*



Source: E.ON Kernkraft – Calculated according to EET-methodology (first year of operations not included)

E.ON Kernkraft - Corporate Governance

- Safety always over weights profits
- Keep plants operating at high safety levels

* KKI 1, KKI 2, KKG, KWG, KBR, KKK

2008: E.ON leads in safety and performance

TOP	Country	Nuclear Power Plant	Utility	Vendor	Gross Capacity MW	Gross Generation bn kWh
1	France	Chooz B1	EDF	Areva NP	1.560	12,84
2	Germany	Isar 2	E.ON Kernkraft	Siemens	1.475	12,09
3	Germany	Brokdorf	E.ON Kernkraft	Siemens	1.480	12,04
4	France	Civeaux 2	EDF	Areva NP	1.561	11,83
5	Germany	Emsland	KLE	Siemens	1.400	11,49
6	France	Chooz B2	EDF	Areva NP	1.560	11,45
7	Germany	Neckarwestheim II	EnKK	Siemens	1.400	11,43
8	Germany	Philippsburg 2	EnKK	Siemens	1.458	11,43
9	USA	South Texas 1	STPNOC	Westinghouse	1.413	11,32
10	USA	Palo Verde 3	Arizona NPP	Westinghouse	1.436	11,3

Operations in Germany since 1967 in together 26 plants + 5 decommissioning

In last 29 years, 23 times E.ON world champion

Availability of plants operated by E.ON in 2008 again > 90%

E.ON - leading in safety and performance

1980	Unterweser	9,81 bn kWh (world record)	1995	Grohnde	11,36 bn kWh
1981	Unterweser	9,54 bn kWh	1996	Philippsburg 2	11,47 bn kWh
1982	Biblis B	9,74 bn kWh	1997	Grohnde	12,53 bn kWh (world record)
1983	Grafenrheinfeld	9,96 bn kWh (world record)	1998	Grohnde	11,76 bn kWh
1984	Grafenrheinfeld	10,15 bn kWh (world record)	1999	Isar 2	12,27 bn kWh
1985	Grohnde	11,48 bn kWh (world record)	2000	Isar 2	11,94 bn kWh
1986	Grohnde	10,79 bn kWh	2001	Isar 2	12,40 bn kWh
1987	Grohnde	10,21 bn kWh	2002	Isar 2	12,17 bn kWh
1988	Palo	10,86 bn kWh	2003	Isar 2	12,32 bn kWh
1989	Grohnde	10,86 bn kWh	2004	Isar 2	12,24 bn kWh
1990	Grohnde	10,69 bn kWh	2005	Brokdorf	11,99 bn kWh
1991	Emsland	10,83 bn kWh	2006	Isar 2	12,44 bn kWh
1992	Brokdorf	11,33 bn kWh	2007	South Texas 1	12,36 bn kWh
1993	Unterweser	11,40 bn kWh	2008	Chooz B1	12,84 bn kWh (world record)
1994	Isar 2	11,13 bn kWh			

Operations in Germany since 1967 in together 26 plants + 5 decommissioning

In last 29 years, 23 times E.ON world champion

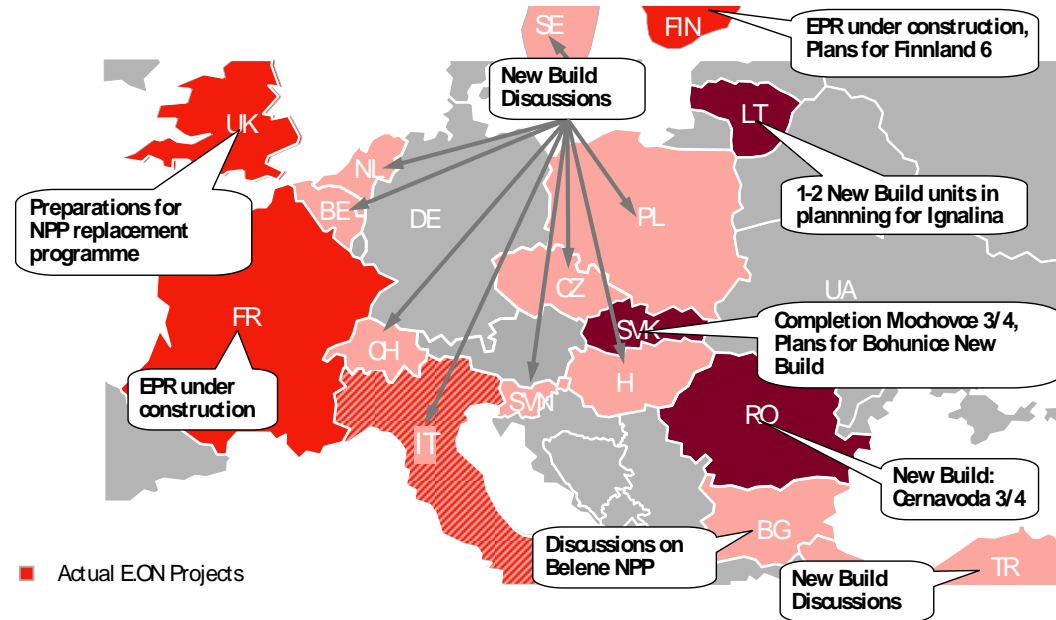
Availability of plants operated by E.ON in 2008 again > 90%

Nuclear New Build activities

Actually there are worldwide...

- 436 NPPs in operation
- 53 NPPs under construction
- 108 NPPs in planning
- 267 NPPs announced.

Worldwide NPP New Build potential estimated up to 91 GW until 2020 and further 1000 GW until 2050.



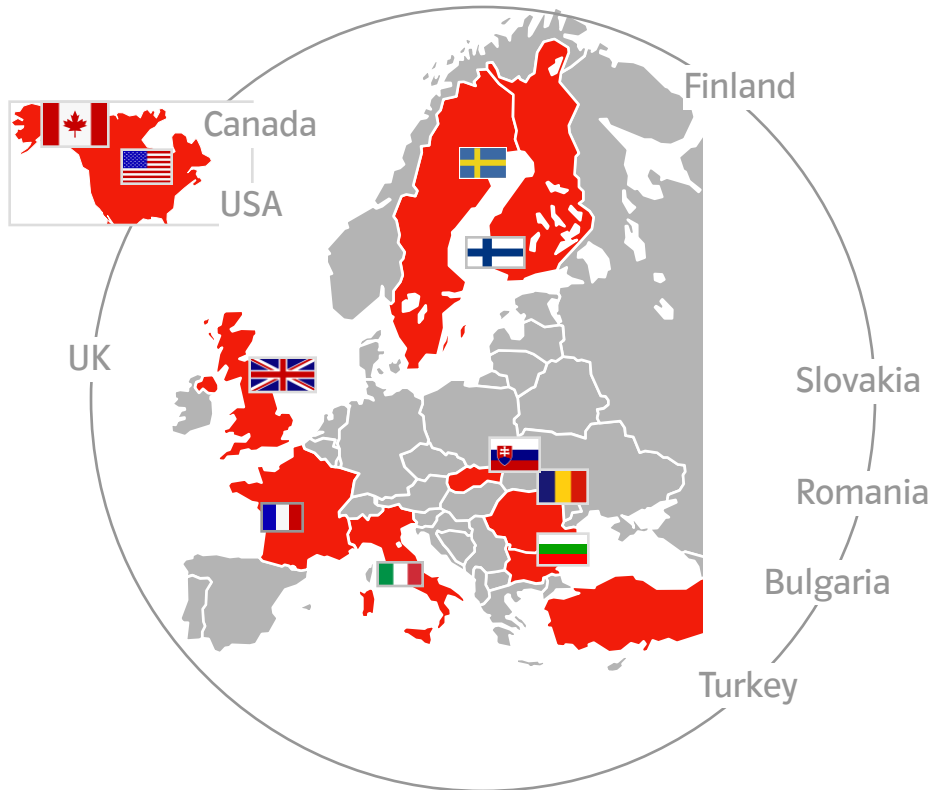
In Europe

- Public acceptance of nuclear is rising
- Nuclear New Build is getting more and more attractive
- Even countries like e.g. Italy, Belgium or Sweden, that already once decided to phase-out of nuclear, nowadays think again about nuclear New Builds

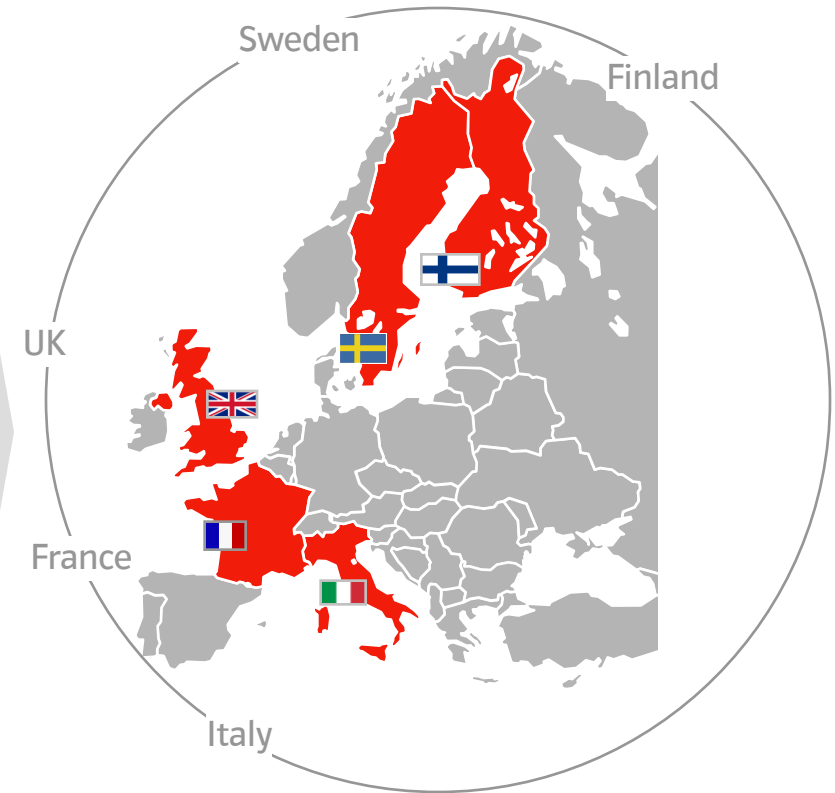
Nuclear investment volume until 2020 estimated between 180 and 540 bn US Dollar

E.ON New Nuclear Development: from Screening to Consolidation

Nuclear Project Development in 2007 - 2008



... and in 2009



- US, CEE and Turkey are no longer considered due to regional refocusing and capital constraints
- In addition to UK and Finland, opportunities in France, Italy and Sweden came up
- New-build footprint in western countries with well-established nuclear excellence

E.ON – Strategic cooperations within the nuclear sector

Range of international “nuclear” partnerships

Project-
development



Trilateral agreement with AREVA/Siemens/E.ON
Creation of a 50/50-Joint Venture together with RWE

Minority stake in Fennovoima (34%)
Three preferred reactor technologies: EPR, KERENA, ABWR

Reactor-
technology



Contribution to the technical development of the EPR

Joint development of the boiling water reactor KERENA

Research



Cooperation with the Commissariat à l'Énergie Atomique in nuclear research (materials, reactor technologies, next generation designs)

Pre-selected reactor designs subjected to *site-independent* review activities at E.ON:



**EPR (PWR)
AREVA**



**ABWR (BWR)
Toshiba/Westinghouse**



**AP1000 (PWR)
Westinghouse**



**KERENA (BWR)
AREVA**

Summary :

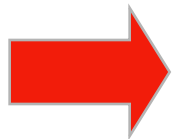
Worldwide renaissance of nuclear power is reality.

Reasons:

- increasing power consumption vs. aging generation fleet
- economically competitive
- facilitates security of supply
- carbon "free" production

Increasingly the role of Nuclear power in the generation portfolio together with coal, gas and renewables is accepted

- by governments
- by the public



Only with nuclear new build E.ON's **CO₂ targets** can be achieved

Summary

As a fully privately owned market player, E.ON pursues growth and excellence in all its endeavors.

As an owner or co-owner of 21 nuclear power stations, E.ON has a long history of operating plants with partners who share the same values.

As a licensee, E.ON has a qualified experience in licensing processes, decommissioning and waste management in different cultural and regulatory systems.

As an operator, E.ON and its engineers have first-class experience of transferring best practice across the group to permanently improve operations and safety performance.

As a large corporation, E.ON has a strong balance sheet and is well able to drive significant investments in new build.

E.ON is ready to invest in Nuclear New Build