Prague European Energy Forum 2012

Future of Nuclear Energy

Ruediger W. Koenig
RWE Technology GmbH
ruediger.koenig@rwe.com

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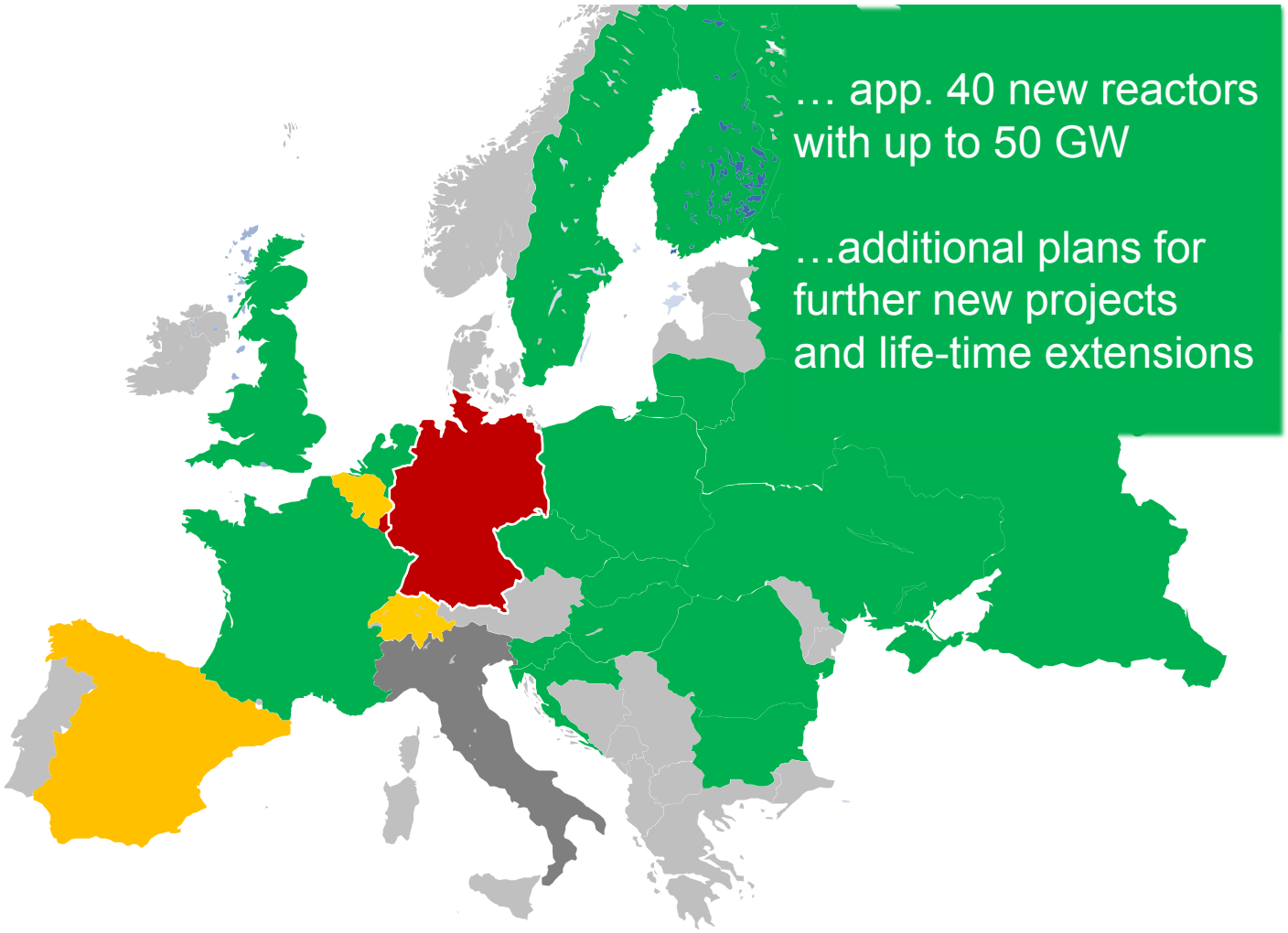
What Policy Says

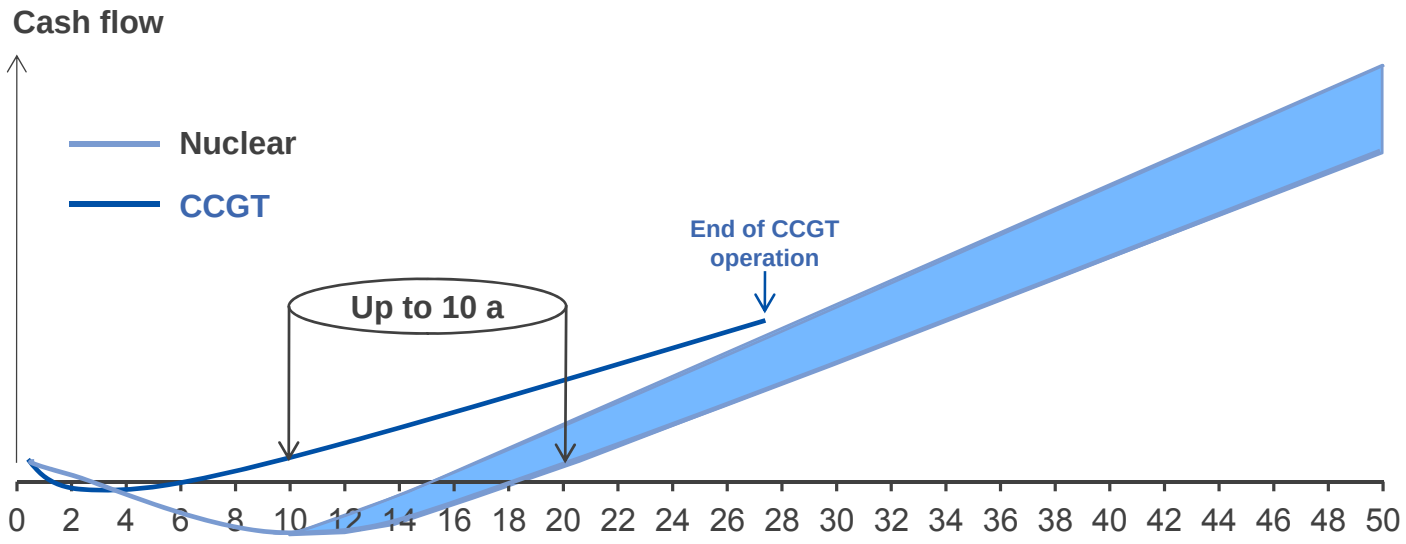
Post-Fukushima most European countries confirm the role of nuclear



Legend: continue/new build; phase-out at end of lifetime; accelerated phase-out

What Financial People Ask:

Where is the payback of nuclear investment?

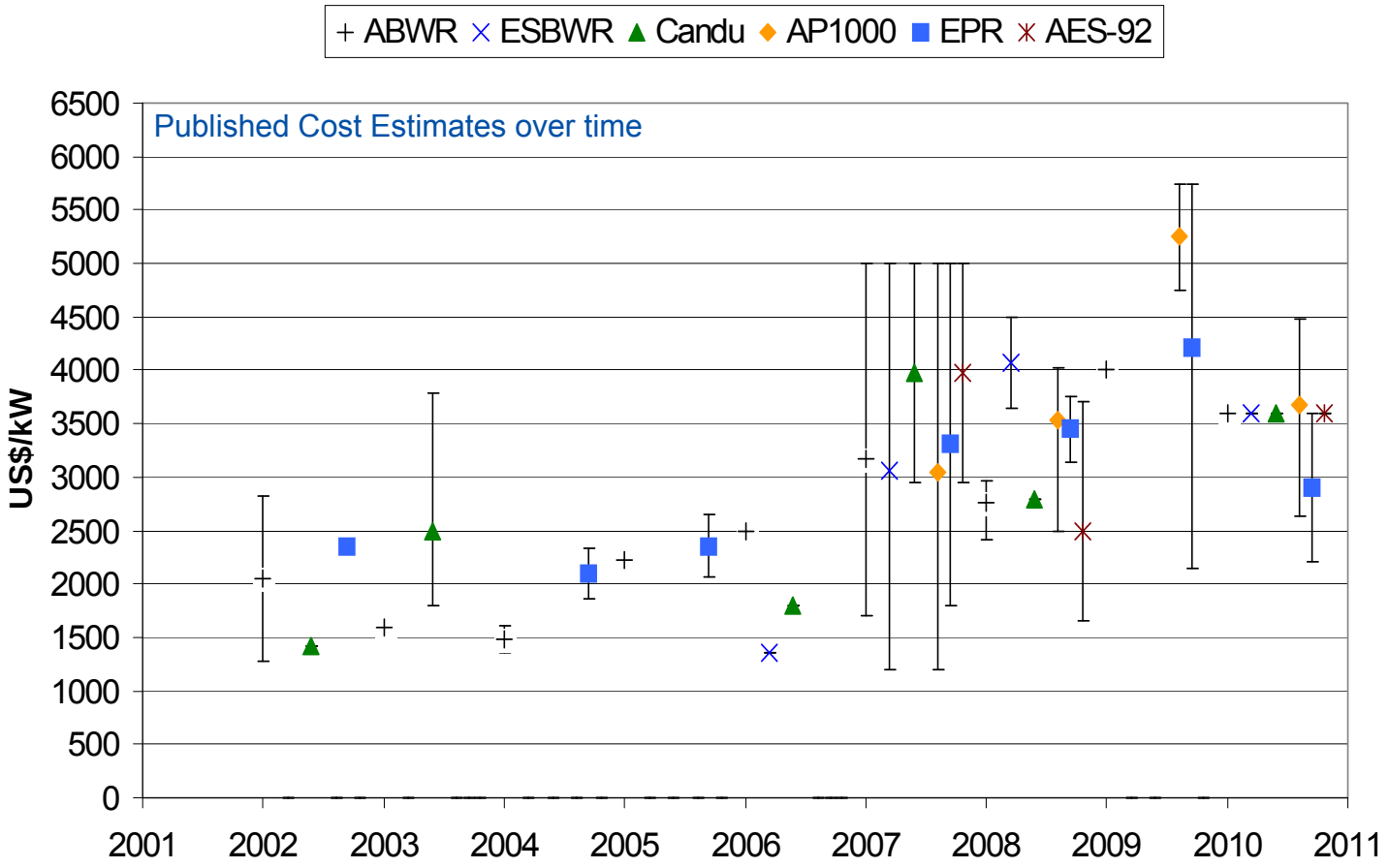


Competitiveness of nuclear newbuild highly depends on:

- Investor expectations vs. long-term macro-/microeconomic value
- Mitigation of newbuild project schedule and cost risks
- Regulatory framework
- Wholesale market structure and power/commodity prices

What is the cost of Nuclear Newbuild?

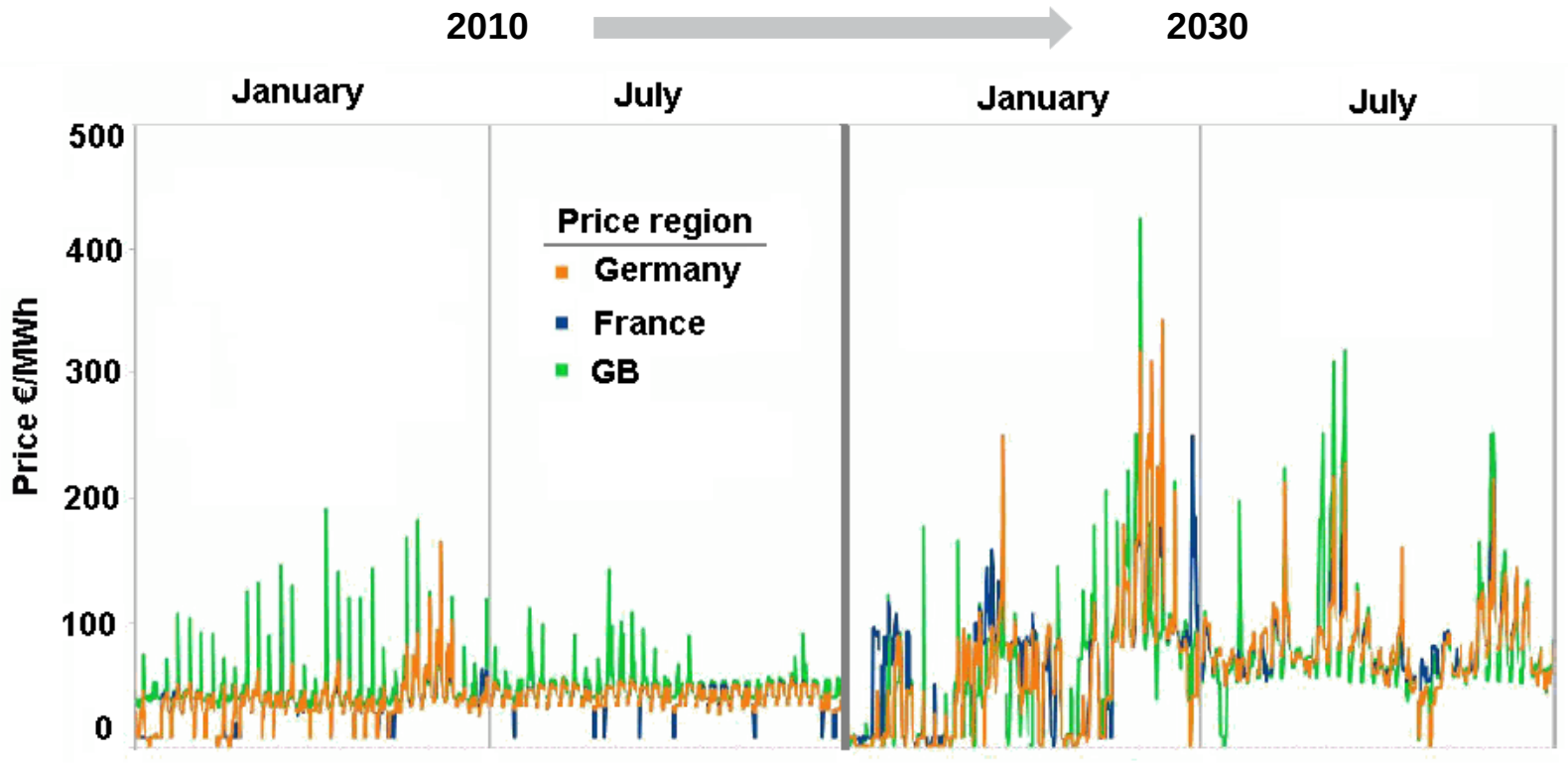
Cost reductions below historic GEN II levels expected…



… but not delivered so far. Instead: Execution risk priced in by market.

Is there a role for baseload power in volatile markets?

Intermittent supply leads to more unpredictable prices with higher peaks



Energy policy and energy markets must enable:

- financing for generation, storage and smart grid/smart demand investments
- development of suitable mechanisms for risk transfer

Source: Pöyry Study, June 2011

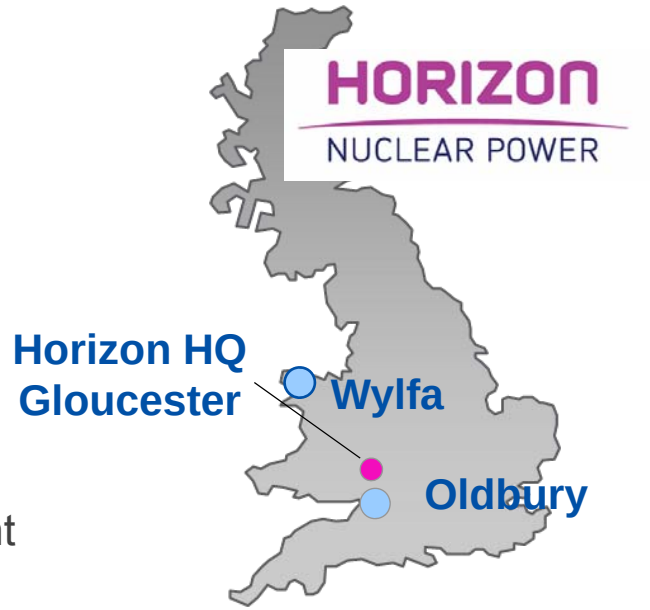
United Kingdom is developing a model for success

Government is working on frame conditions

- Adequate political framework and public acceptance
- Nuclear back-end solutions
- Reliable licensing and consenting process
- Energy market reform
- Financing solutions

Industry is developing suitable solutions

- Holistic and well aligned project development and execution approach by vendors and customers
- “Smart” contracting models for risk reduction
- Fit-for-purpose project organizations of all participants



Private industry is engaged in UK nuclear newbuild

Description

> Technology:	Westinghouse AP1000 *or* Areva EPR
> Capacity:	~3GW Wylfa plus ~3GW Oldbury
> Cooling concept:	Sea Water (Wylfa)
> Status	Project development
> Timeline:	Site license application in 2012/'13 (Wylfa)

Project Structure

> Owner:	Horizon Nuclear Power
> Operator:	Horizon Nuclear Power
> Shareholders:	RWE npower 50 % E.ON UK 50 %
> Status:	~ 140 staff plus support by shareholders and external sources

Scope of RWE Technology

- > Governance support for RWE Group
- > Development and staffing of Horizon
- > Management of vendor selection process (RfI, RfP)
- > Support project management / planning, contracting and technical strategies, concepts for licensing and nuclear safety, front-/backend, O&M
- > Provide negotiations support and contracting support

Nuclear energy can continue to be a cornerstone of European energy supply

Every generating technology has chances and challenges. Identifying the most important ones is the first task.

The EU's energy strategy underlines the key role that nuclear power can play in ensuring European security of supply and environmental sustainability. A suitable policy framework needs to be established.

Broad, stable public acceptance is the highest risk but also the highest need. Nuclear safety, waste management and trust are key factors for acceptance.

Predictable and secure financing strategies are needed to tackle high upfront costs, long payback periods and the specific risk profile of nuclear projects and European energy infrastructure. Partnering and risk diversification are part of the solution.

Backup

Policy Overview 1/2

Member State	Future Nuclear Policy Plans
Bulgaria	Wants to use nuclear energy as the pillar of its strategy to secure the country's energy needs. The completion of the Belene nuclear power plant after 2015 is declared as a priority and the government intends to build two new nuclear units.
Croatia	(About to join the EU in 2013) is considering the possibility of building its own new nuclear plant. It continues to operate its co-owned plant Krsko in Slovenia.
The Czech Republic	Plans to strengthen its position as a primary electricity exporter in Central Europe. The Czech government and its dominant producer CEZ want to speed up the process of completion of at least two new units at the Temelin nuclear power plant. The project completion is planned to be followed by building at least one more unit at the Dukovany nuclear plant.
Finland	Proceeds with building its first Gen III reactor at Olkiluoto. There are also approved plans to construct a fourth unit at the Olkiluoto power plant. Finland has been also the first EU Member State after the Fukushima accident to announce a greenfield site for a new nuclear project. The Fennovoima consortium has decided to build Finland's seventh nuclear reactor in the municipality of Pyhäjoki.
France	Continues with construction of its first reactor of Gen III type at Flamanville. The project for a second reactor at Penly slowed down. Public statements by politicians indicate that the nuclear share is very likely to remain above 50% of electricity for the foreseeable future.
Germany	Is implementing a policy of complete nuclear phase out by 2022.
Hungary	Has not reversed its decision to rely on nuclear as the pillar of its energy security. The Parliament already approved plans for increasing the existing capacity of its only nuclear plant at Paks by 2025.

Source: ENEF Draft 2012

Policy Overview 2/2

Member State	Future Nuclear Policy Plans
Italy	Held a referendum in the aftermath of the nuclear accident in Japan. Voters were opposed to a return to nuclear power.
Lithuania	Has decided on a strategic investor for the Visaginas nuclear plant, considered to be one of major projects for securing the energy needs of the Baltic region. The Lithuanian government has notified the European Commission of plans to construct the plant.
The Netherlands	Plans to continue with steps towards construction of a new nuclear power plant at Borssele.
Poland	Has reconfirmed its plan to use nuclear energy for the first time and has completed the legal framework for construction start of new nuclear plants with up to 6000 MW of installed capacity.
Romania	Still considers as its national energy priority completion of Units 3&4 at Cernavoda nuclear power plant.
Slovakia	Is in the final stage of completion of Units 3&4 at the Mochovce plant. Moreover a feasibility study for constructing a fifth unit at the Bohunice plant is being prepared.
Slovenia	Expects parliamentary approval of an application for a permit to build a Gen III unit. It will replace the existing capacity of Krsko nuclear plant.
Belgium and Spain	Have no plans for replacing existing nuclear capacity. This theme remains in both countries politically sensitive. However the new Spanish Government is considering extending the life of the Garoña plant, where Belgium discusses an accelerated phase-out.
Sweden	Abandoned its phase out policy in June 2010. The country wants to replace the current capacity with new units as they retire.
United Kingdom	Already announced (summer 2011) 8 selected sites for at least 10 new power plants as part of its strategy of meeting the country's future energy demands and climate goals. A new legal framework for securing investments in carbon free energy sources is in an advanced stage of preparation.

Source: ENEF Draft 2012