



ALICE Workshop

Transforming the energy system to achieve the 2°C target: investment risks and policy challenges

The role of New Coal/CCS in transforming the energy system - Setting the scene

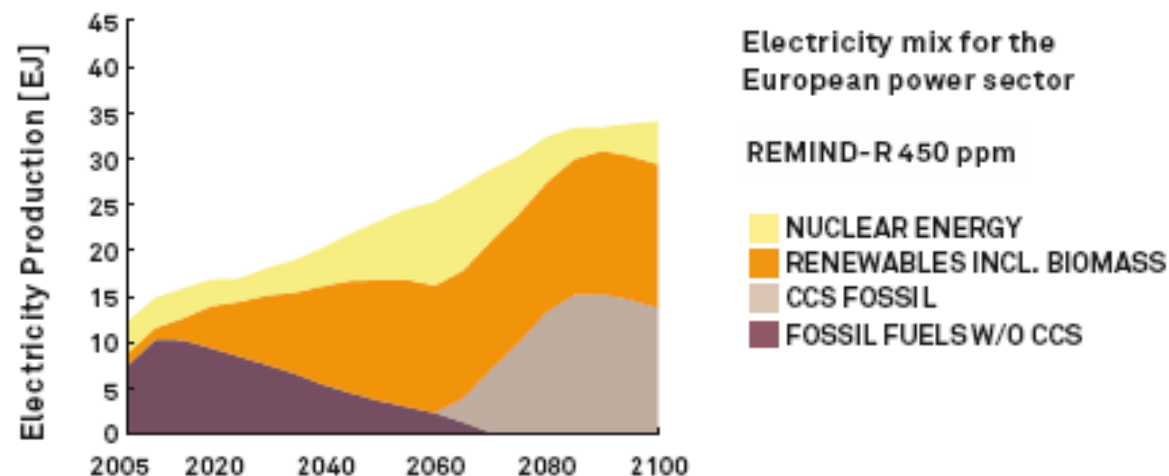
Michael Pahle, PIK Potsdam



ALICE Workshop, Potsdam, 11.-12.3.2010

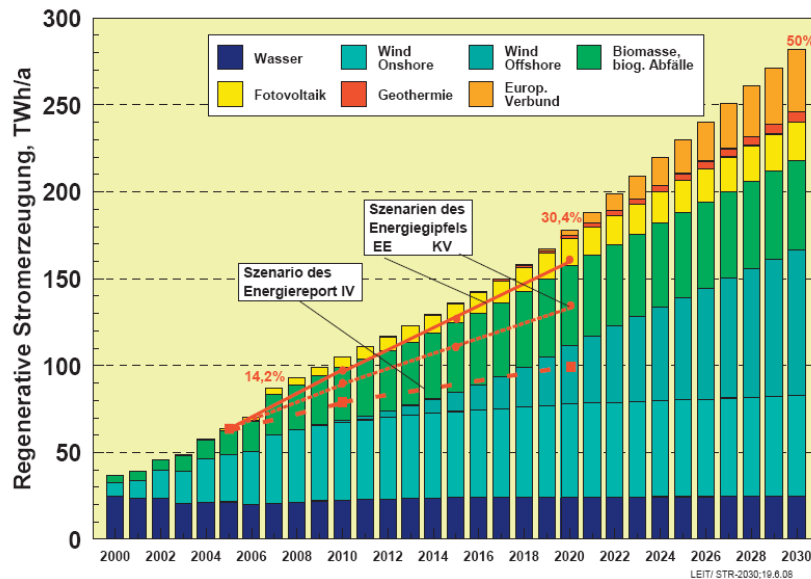
Looking from above – macro long-term pathways

- IAMs assess **mitigation** costs and options on a **global scope**
- **Power generation** is the **key sector** for the mitigation of greenhouse gases
- REMIND “suggests” **phase out of conventional fossil power** in Europe from 2010 on; **CCS renaissance** in 2060 (international emission trading in all sectors)
- Moreover: necessary **early action** regarding deployment of **renewables**



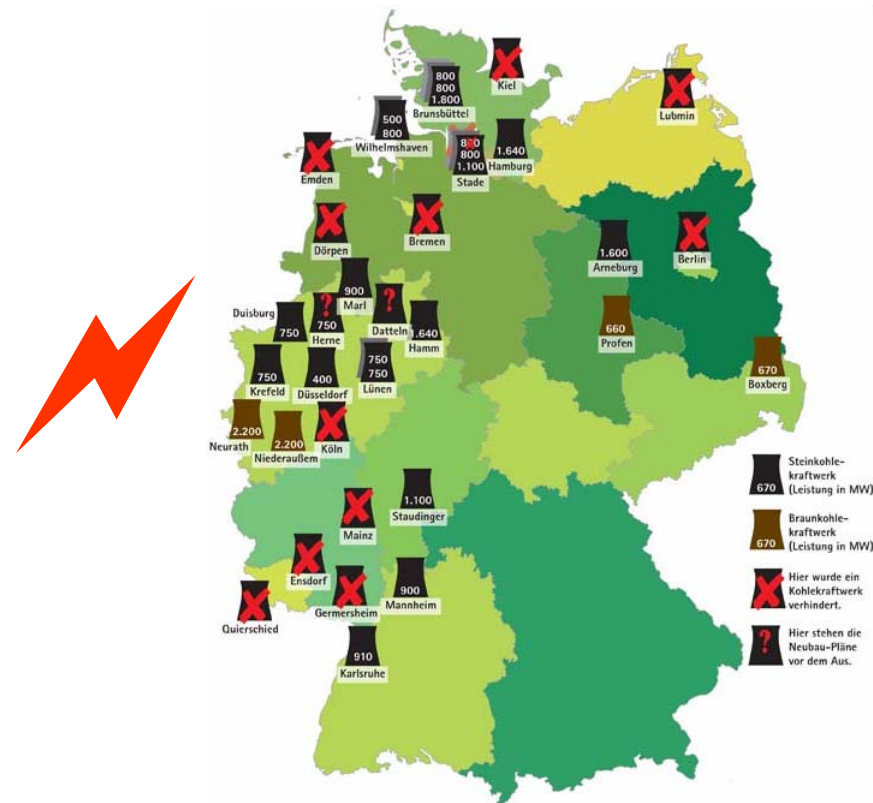
Discrepancy of what happens / what is wanted (DE)

- Ambitious targets for **renewable** deployment in the future
- Share in electricity generation ~35% in 2020 and up to 50% in 2030 (2009/28/EC)



Source: BMU (2008)

- Currently 9 **coal** plants under construction, plans for more pending
- Total capacity of projects (11.5GW) around 15% of annual peak demand



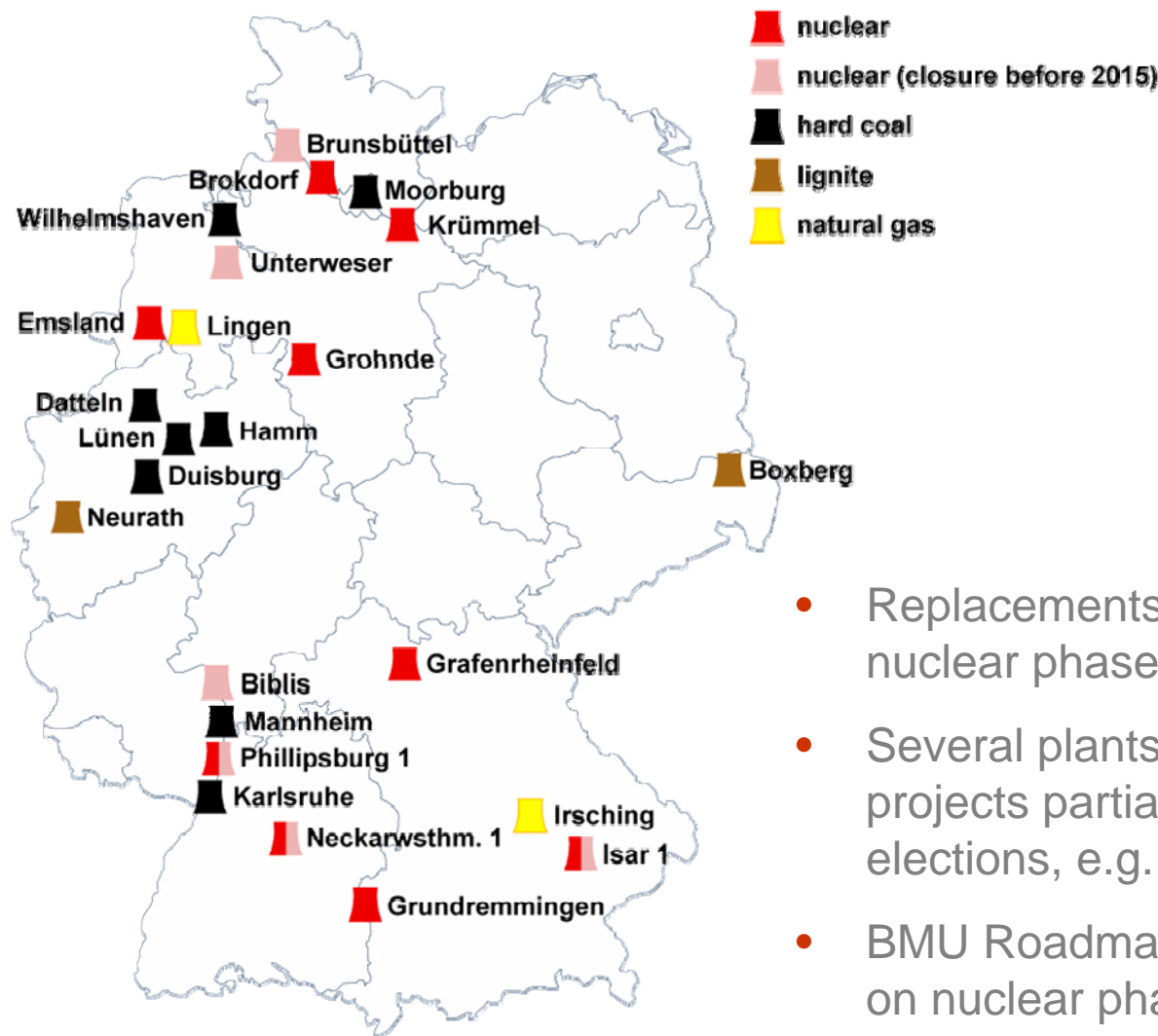
Source: BUND (02/2010)

- Are coal plant investors **misguided** / **ignorant** / **strategic**?
- **Market economy!** In general the **market** and its **actors** are assumed to uncover what is best for society (unless it fails for whatever reasons)
- **Liberalization** of EU electricity markets in the 90ies to this account
- Understanding of **investment trends & drivers** is **key factor** for energy transition (and inherently **complex** in liberalized electricity markets)
- **ALICE Project**: investigate at what decisions investors arrive under climate policy and for what reasons
- **Two stages** to look at: encourage clean investments (**carrots**, WG 2/3), discourage dirty investments (**sticks**, WG1)
- In the **presence of sticks** (EU ETS), why do we see so many new coal plants?

Germany's dash for coal: Exploring drivers & factors **ALICE**

- **Case study** just about what the title says; identifies **six** drivers / developments / decision factors to **plausibly explain** the outcome:
 - Phase out of **nuclear power** triggered extensive (base load) **replacement**
 - Onset of a new **investment cycle** for respective investors including “**cross-subsidies**” from ETS **windfall profits**
 - Favorable long-run **economic conditions for coal** compared to natural gas including **CCS** as an option to **cap CO₂ prices** in the future
 - **Status-quo bias** in regard to future **renewable** deployment (dissolution of base/peak load categories)
 - Explicit **political support** (ETS support, part of roadmaps)
 - **Ineffectiveness** of **public protests** in hampering new projects (1,5 exceptions)
- Essentially driven by **economic arguments**, supported from **political level**, enforced **against society**, and possibly **planned too short-sightedly**
- Broad **industry consensus** that coal will still play a role in the mid-term future (“the remaining share”)

Some details 1: Replacement of nuclear plants

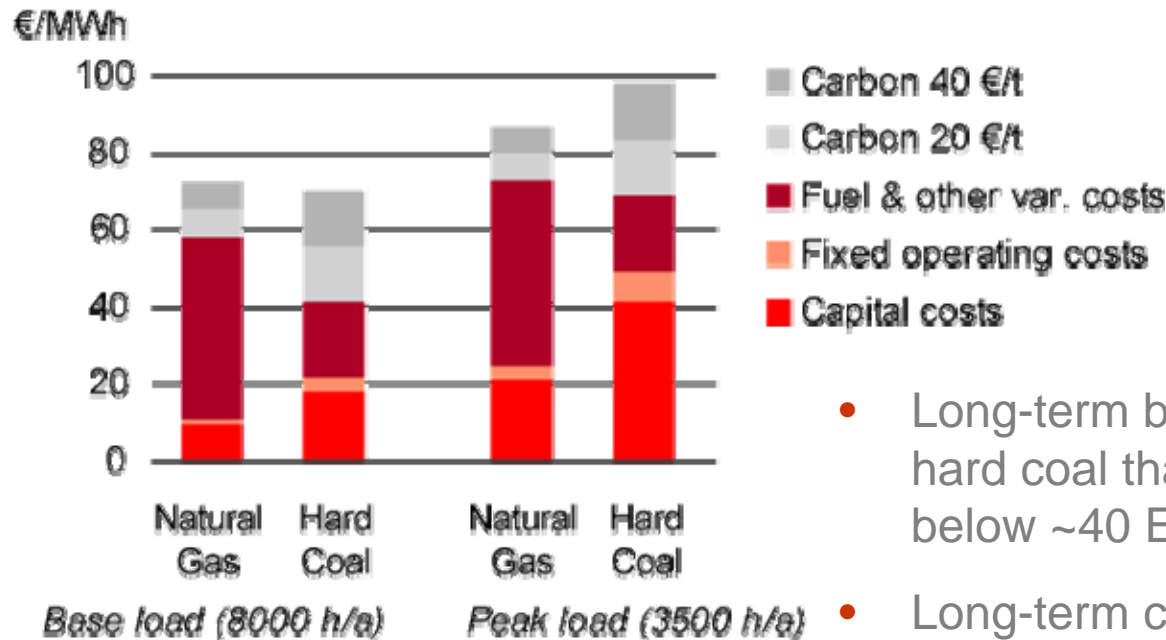


Source: Pahle (in press)

- Replacements requirements due to nuclear phase out **now**
 - Several plants can be “**matched**”; new projects partially cancelled after elections, e.g. Lubmin
 - BMU Roadmap (2009) put higher priority on nuclear phase out
- **Old nuclear or new coal?**

Some details 2: CCS “puts” cap on carbon price

Long-term new entry costs (Europe)



Source: E.ON (2008)

- Long-term base load supply cheaper with hard coal than natural gas if carbon price below ~40 EUR/t
 - Long-term costs for **CCS** probably in the same order of magnitude → **cost cap!**
 - Some analysts assume that **introducing CCS** is primary objective of EU ETS
 - Additional **windfall profits** through free allocations
- **Does the EU ETS drive coal?**

- “To a great extent, the transition to a low carbon power sector means dealing with coal plants.” (Blyth, IEA 2010)
- “Coal: Can’t Live With It, But Not Without It, Either.” (Electricity Journal 2010)
- **Wolfgang Dirschauer**, Vattenfall Europe AG:
*New Coal/CCS from a **investor**’s perspective*
„Coal is here to stay - either with or without CCS. We make the difference.“
- **Christoph Bals**, Germanwatch:
*New Coal/CCS from an **NGO**’s perspective*
“Can CCS be a bridge to a renewable energy future?”
- **Wilhelm Kuckshinrichs**, FZ Jülich:
*CCS from a **scientific** perspective*
“CCS: expected high potential to reduce CO₂, necessary preconditions for success not yet established.”