# 20-20-20: What will be the role of gas?

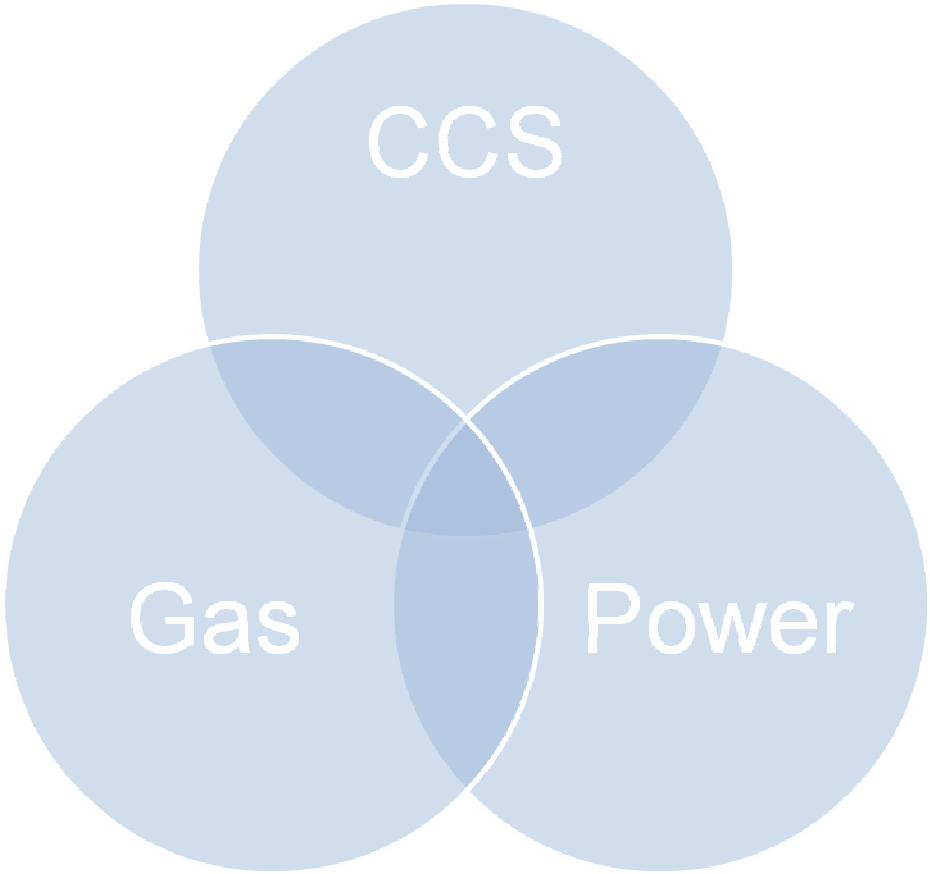
**Future challenges and opportunities to the industry**
**Or: Can gas continue to be the residual in power?**

**Sparks & Flames**
**December 2009**

Karen Sund

www.sundenergy.com

# Sund Energy helps navigate into the energy future…




**Seeing across segments help**

- Gas, power and environment
- Industry + government/regulation
- Commerciality in a technology world
- Environment, economy, SoS

**Often involved in long term infrastructure projects**

- Need to see different scenarios
  - Not only base case +/- 10%
- Part of this is "the other side"
  - What is obvious and attractive to one could well be a threat to another
- Making strategies that are robust to uncertainty

**…by seeing the full picture and designing solutions using diverse and international experience and broad contact network**

# A word of caution

**This presentation will NOT discuss**

- The climate issue and if emission reductions are needed
- If the current policies are right or even realistic
- What is the best answer for all

**This is to illustrate the impact of current EU policies, assuming they go ahead (20-20-20 + SoS)**

- Drivers and motivation – impact on realism

**Main purpose is to show how the future outlook for gas to power has changed from only a few years ago**

- Impact on gas industry – flow, prices, investments

# We have grown up believing in gas as the green response

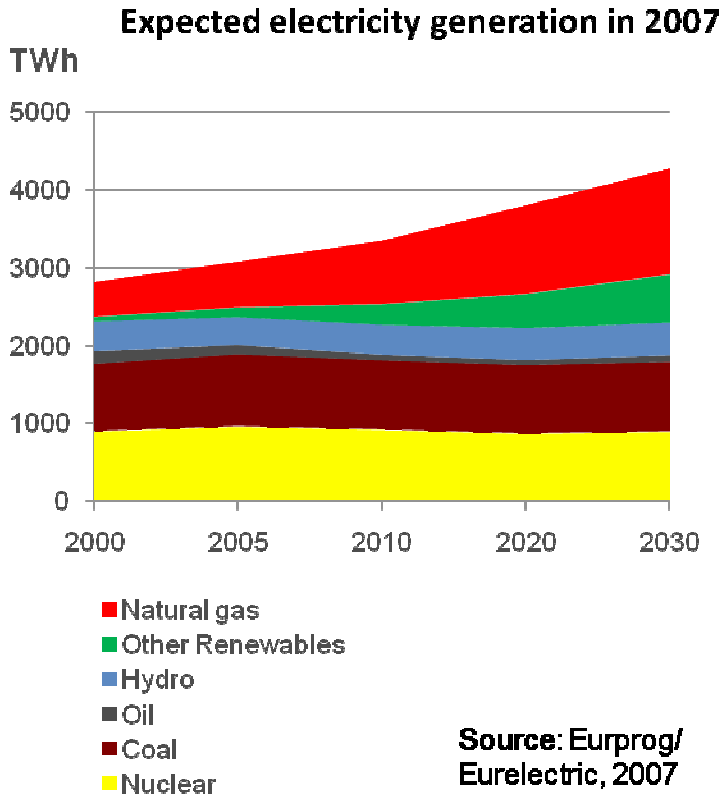
**For the last 20 years, energy policy has been relatively easy to predict**

- Close down nuclear
- Retire old lignite and coal
- Build some wind and other renewable

**Gas as the residual: Remaining power needs to be met by natural gas (CCGT)**

- Quick, cheap, and smart
- Driving gas investments in exploration, production, transport (pipelines and LNG), and storage

**But how will this be in the future?**




**Source**: Eurprog/ Eurelectric, 2007

# Voters/politicians have new concerns, not fixed by gas

**National economy and energy prices**

- Always important, but this year even more so
- Combination of record oil and gas prices with starting recession was hard

**Security of supply and geopolitics**

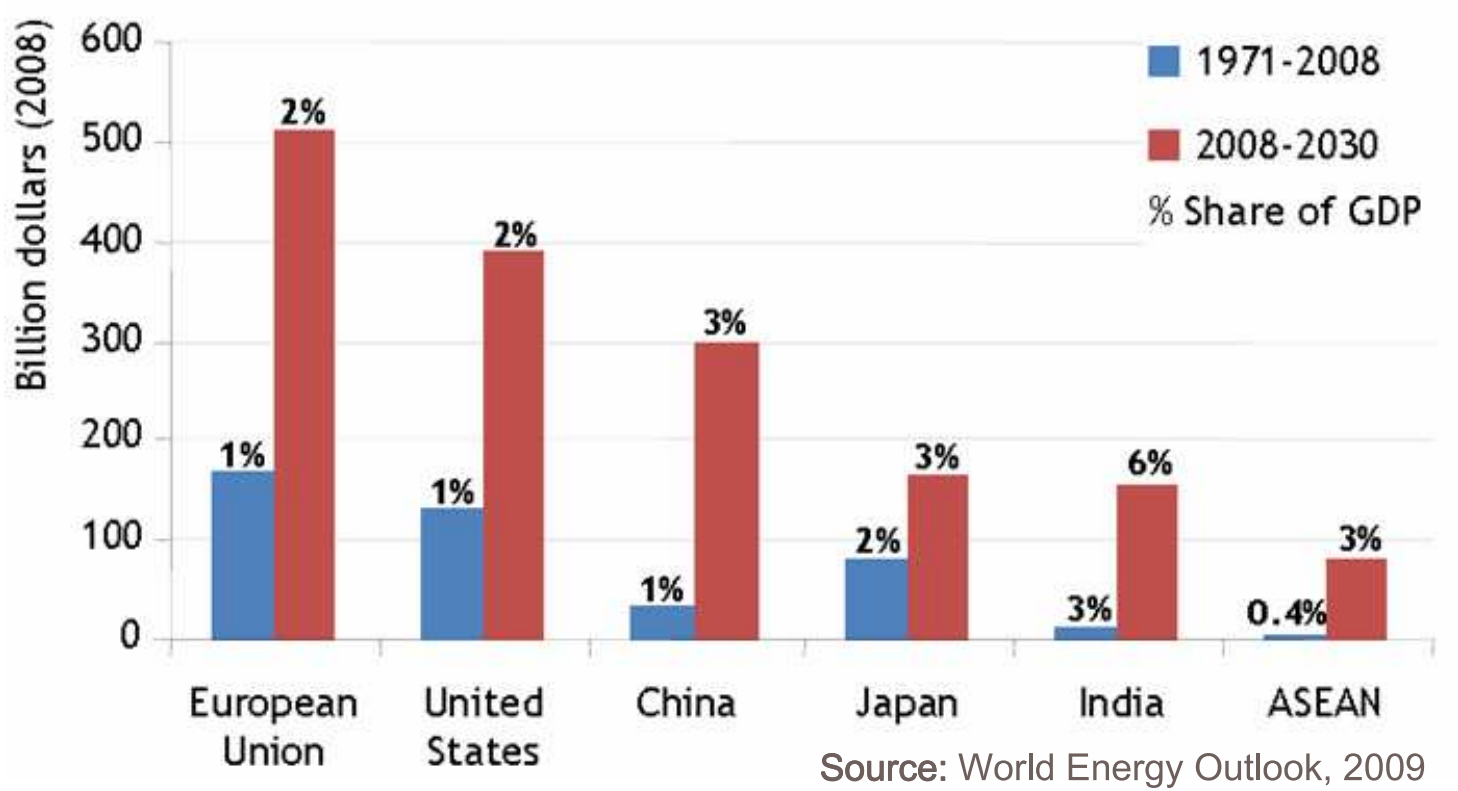
- Always important, but this year made more voters aware of gas "risks"
- Tool for showing strength – both politically and commercially...

**Environment, mainly climate gases**

- Need to show action – emissions keep rising, but recession helps...
- Easier to fix power generation than transport sector
- Some government funds available for this

# Imports are getting more expensive, also for the EU

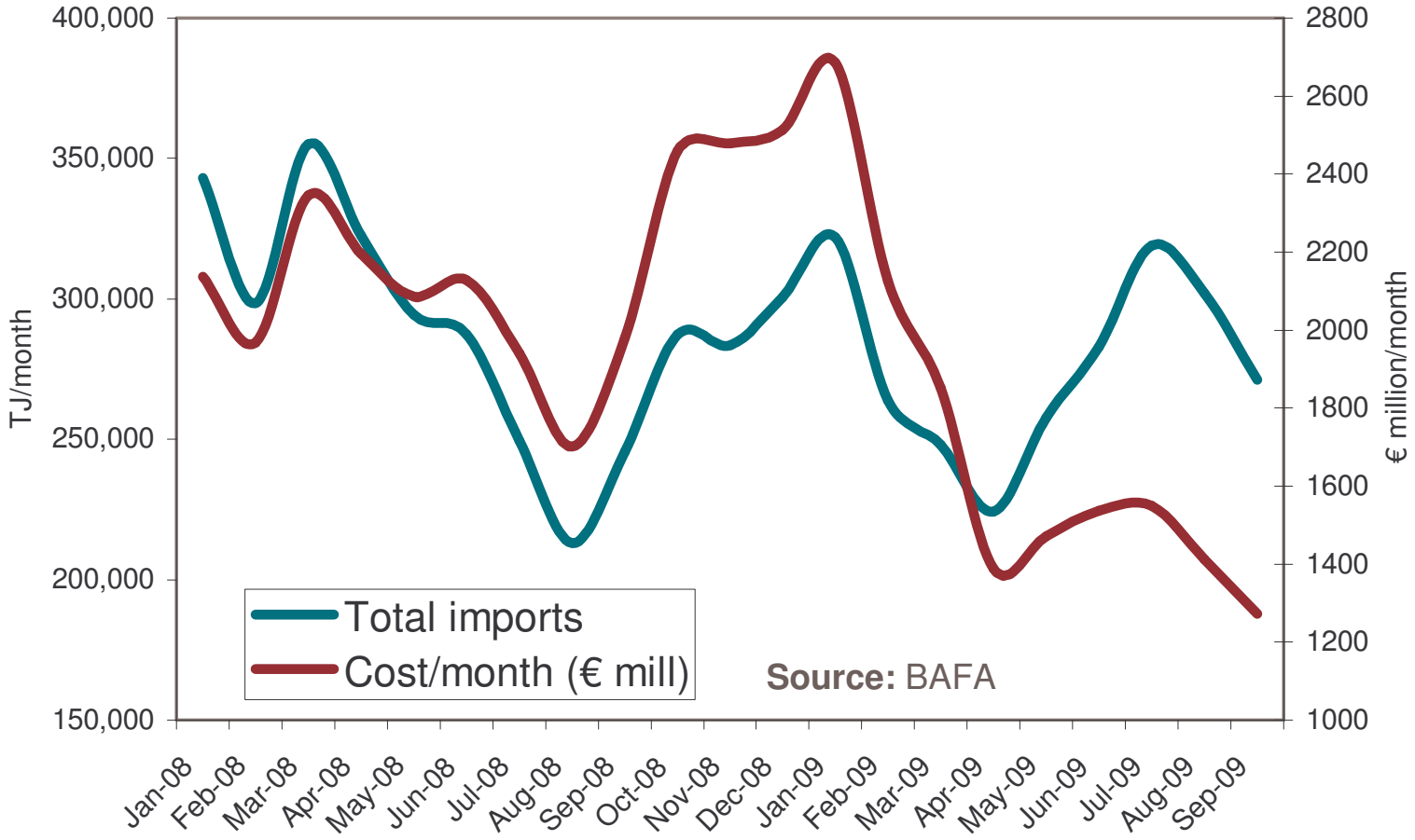
Average annual expenditure on net imports of oil & gas in the reference scenario



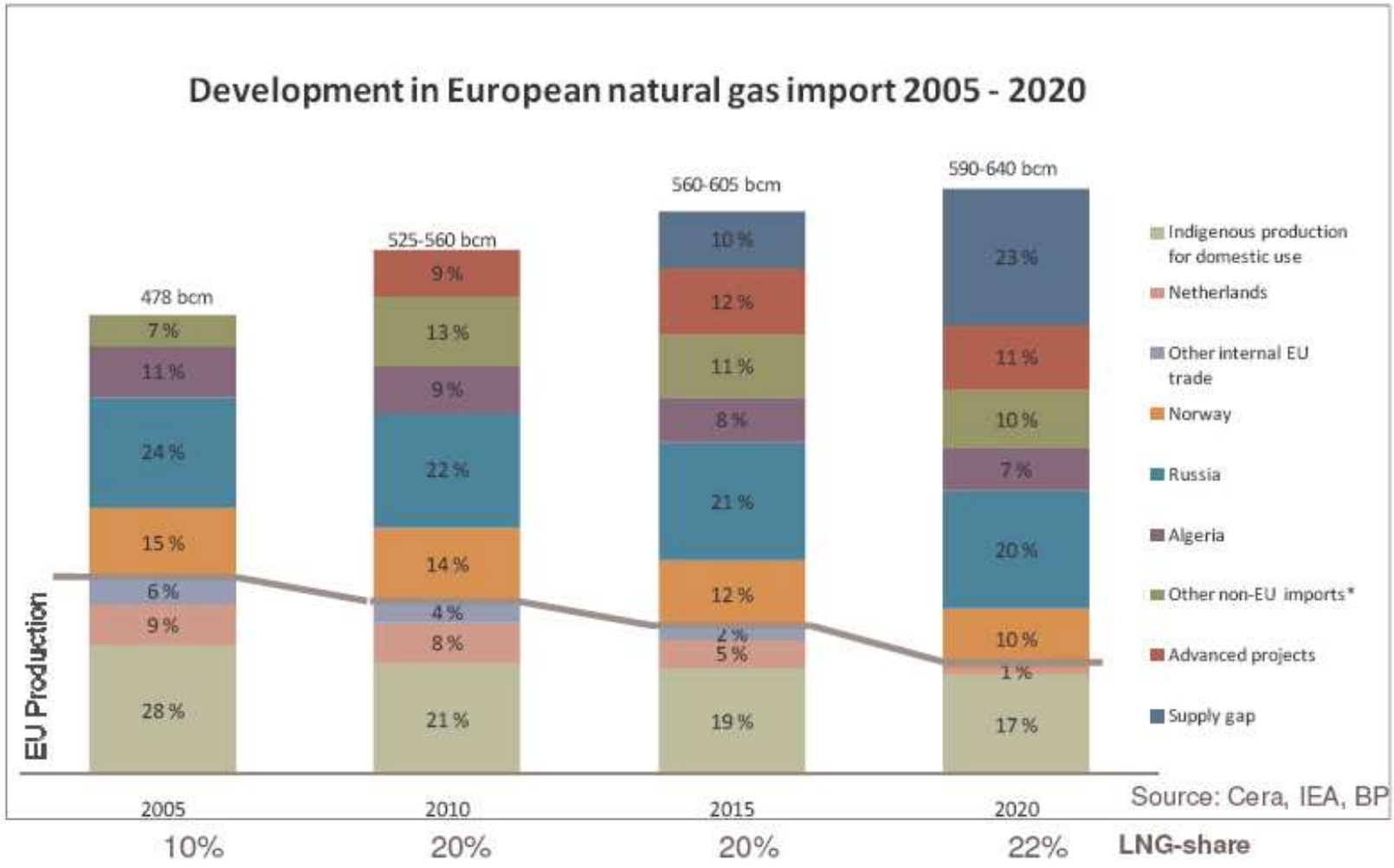

**Source:** World Energy Outlook, 2009

# German gas imports illustrate the cost element

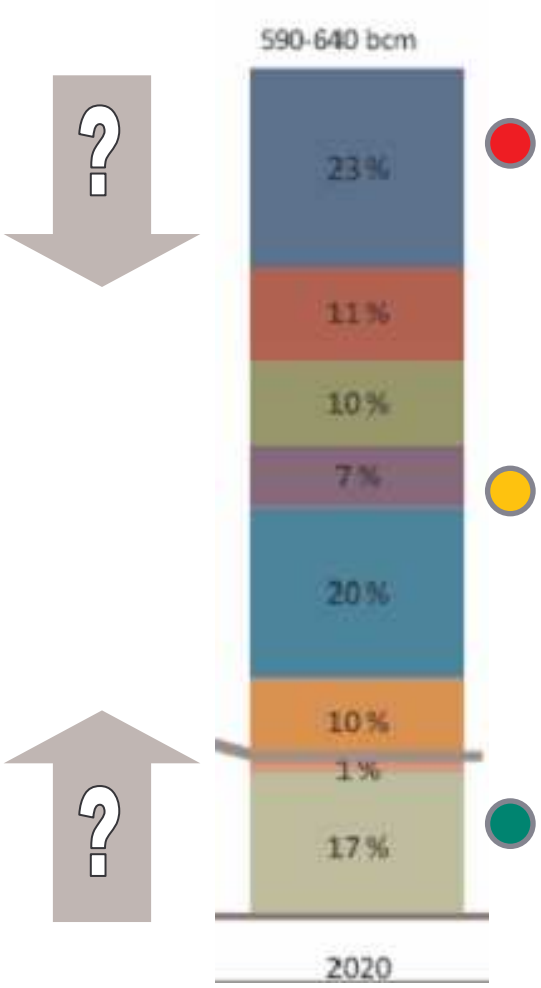
## Gas imports to Germany 2008 and 2009 (Q1-3)



# The traditional view of future gas demand and supply



# Different comfort levels will impact use of gas




**Current perception is that EU is very vulnerable**

- This year's Ukraine incident strengthened this perception

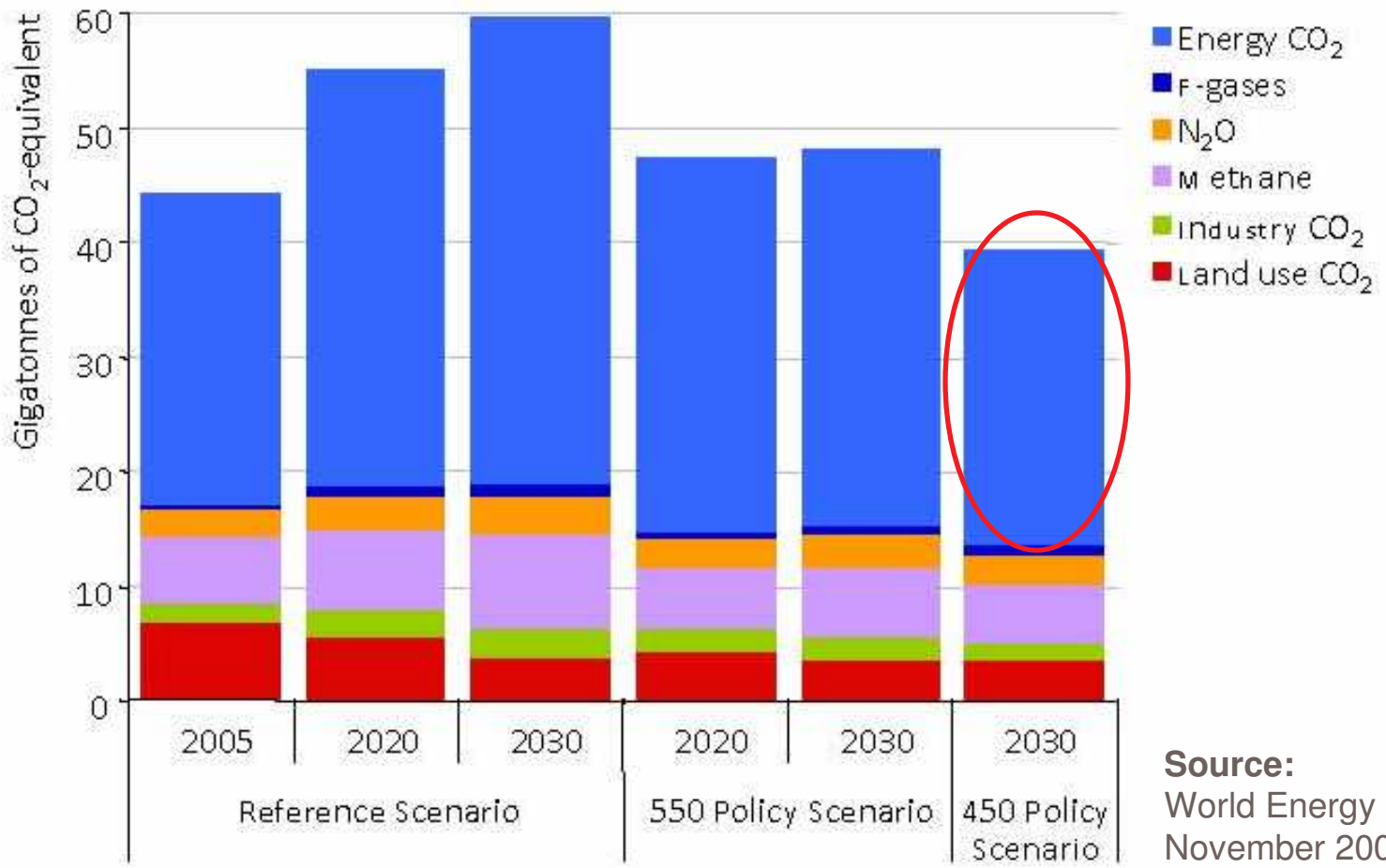
**This may change IF**

- Demand falls
  - 100 bcm would take away un-contracted demand gap
- Production increases domestically
  - Biogas, unconventional, other
- More over-capacity in infrastructure
  - Redundancy gives optionality

**This scenario may give lower prices and again higher use!**

SUND energy

# With CO2 the main focus, the energy business changes!




**Source:**
World Energy Outlook, November 2008

...especially to meet the 450 ppm scenario, or even 350!

# CO2 focus and trends – waiting for COP15, or not?

**Post Kyoto discussion on abatement: How, where and who pays?**

- Typically, governments are awaiting a ”global agreement” in Copenhagen at the COP15 later this month
- All major emitters seem to be waiting for all others to take action
  - Little concrete action/investment compared to perceived needs
- What is the chance of reaching a prefect agreement?
  - Is it really a ”cop-out”?

**There has been some optimism around ”economic abatement”, but**

- This has not been fully implemented either – stickiness?
- Responsibility put on governments mainly?
- But there is one exception!

# Contrary to many expectations, China is taking action

**IEA now expects China to be responsible for 25% of global reductions!**

- Already started, mainly driven by local pollution and SoS
- Long term horizon may give different "right answers" than in Europe
- Very strong record for keeping targets, so far!
- Efficiency makes good economic sense

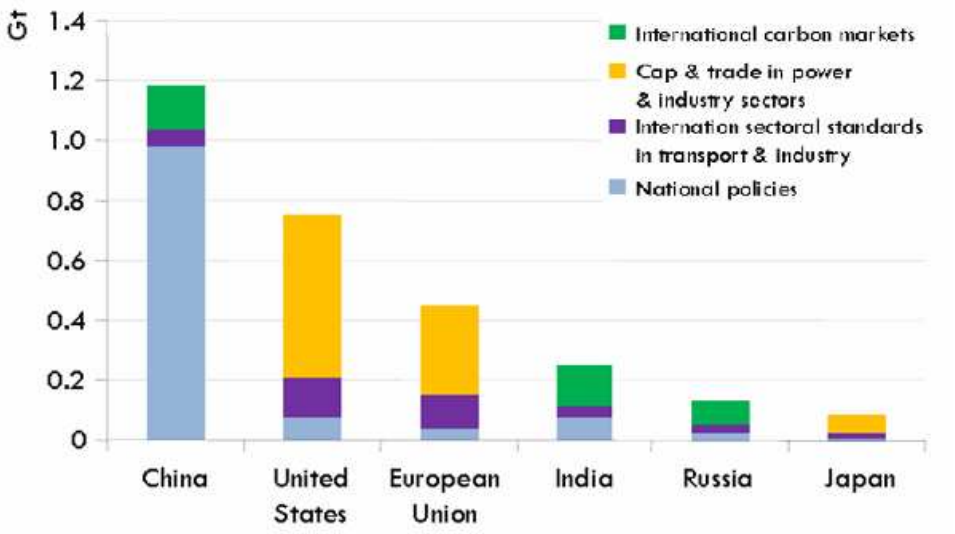
**Ambitious targets for renewab**

- Financially strong and good engineers
- Lower import bill for oil & gas

**Reducing emissions from coal**

- Local pollution serious

Global abatement to 2020 - 450 Scenario




Source: World Energy Outlook, 2009

# New policy “20-20-20”, will have a big impact on gas!

**It sounds simple and wins voters interest**

- Reduce CO2 emissions by 20% (or more) by 2020
- Increase use of renewables to 20% of consumption
  - Including 10% in transport
  - Mainly in power generation – wind and other capacity (more than 20%)
- Reduce overall energy consumption by efficiency – also 20%
  - Sold in as saving €100 billion/year

**Some secondary effects are already clear**

- Develop new technology
  - CCS, fuel cells, offshore wind etc
- Extend life and perhaps build new capacity
  - Nuclear and coal noticeably

# 20-20-20 ticks many boxes – does that secure realism?

**Politicians need to relate to voter preferences**

- "Packaging" and communication important
  - Facts at times too complex
- Emotions can give different weighting…
  - Feel good, fear, perceptions, unknown factors etc

| | Economy for users/ citizens | Environment | Security of Supply |
|---|---|---|---|
| Efficiency/ Δ Consumption | √ | √ | √ |
| Increased used of renewables | √ | √ | √ |
| New technologies/ industry development | √ | √ | √ |
| Renewables in transport | ? | √ | √ |
| Bioenergy from farms | √ | √ | √ |

# What does it do the gas – still the residual?

**Impact on gas, compared to business as usual**

- Lower demand overall
- Lower load factor for what is being used

| | Gas demand | Gas load factor |
|---|---|---|
| Efficiency/ Δ Consumption | ↘ | ↘ |
| Increased used of renewables | ↘ | ↘ |
| New technologies/ industry development | ↘ | ↘ |

**Impact on future gas investments?**

- Exploration, pipelines, LNG chain, storage, power generation…
- All long lead times, expensive, and less attractive than other investments at uncertainty

# The future need for gas could be profoundly different!

**Demand curve will shift down**

- 20% reduction in demand will greatly impact need for all new capacity

**Base load generation from other fuels will grow more than expected**

- Nuclear extended life + new
  - (Especially after 2020)
- Coal extended life
  - Some new with capture technology
- Some biogas CHP and other renewables into the mix

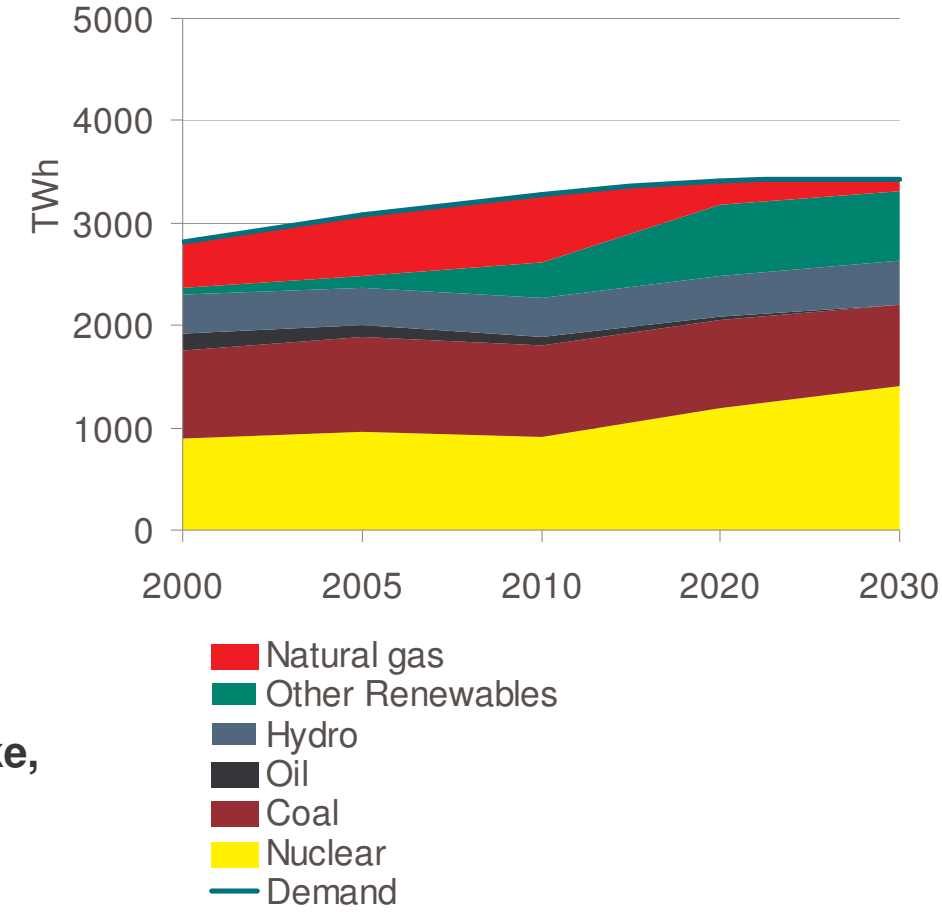
**Main change will be in wind generation**

- Large plans in most EU countries
- Mostly “must-run” capacity

**Is there a gap? If so, what will it look like, and can it be filled by gas??**

**A possible picture of EU generation in 202020**

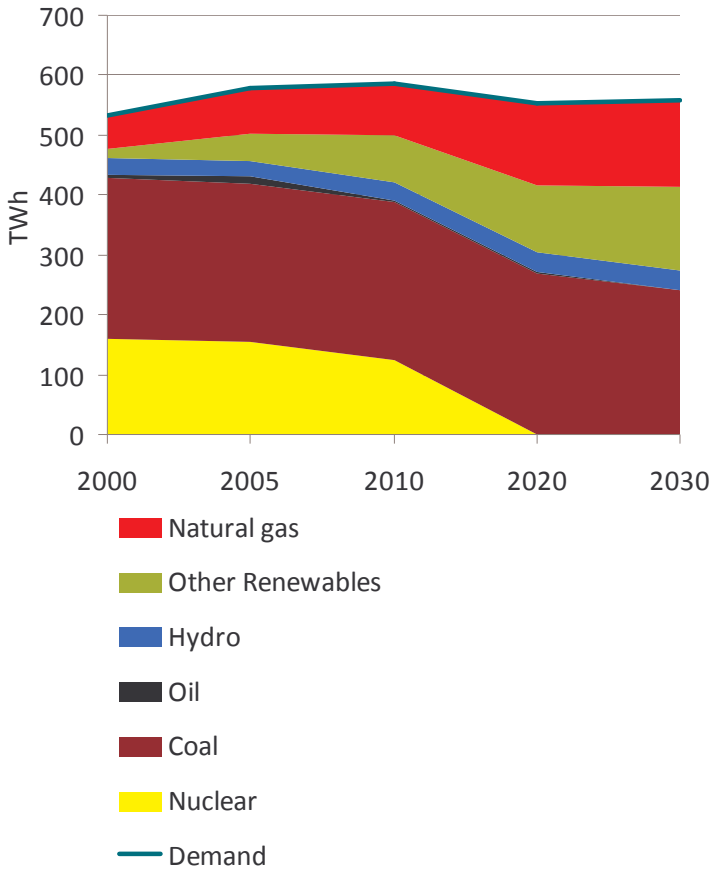
20% lower consumption, more nuclear and renewables




Source: Sund Energy estimations

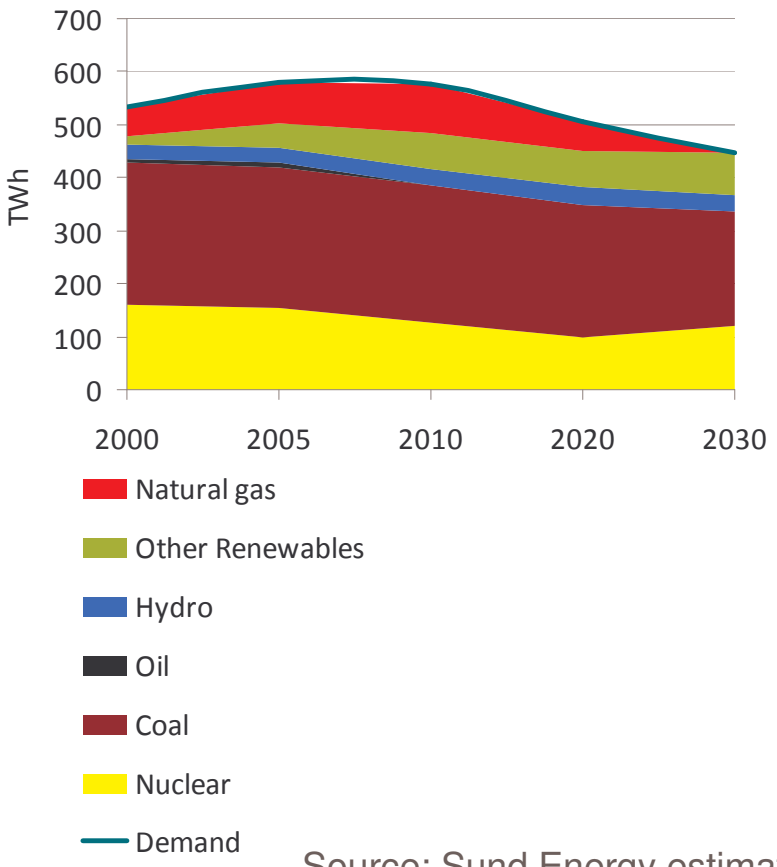
# As an example, Germany would be quite different in gas

**Germany:**
**2007 view of electricity generation**




**Source:** Statistics and prospects for the European electricity sector; EURPROG, 2007

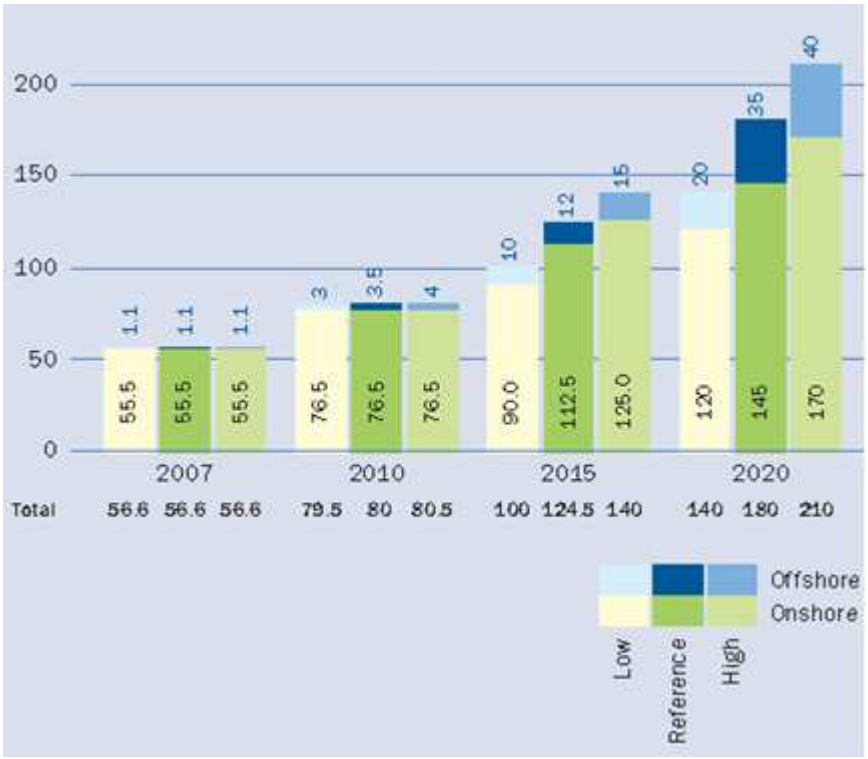
**Germany:**
**20-20-20 view of electricity generation**




Source: Sund Energy estimations

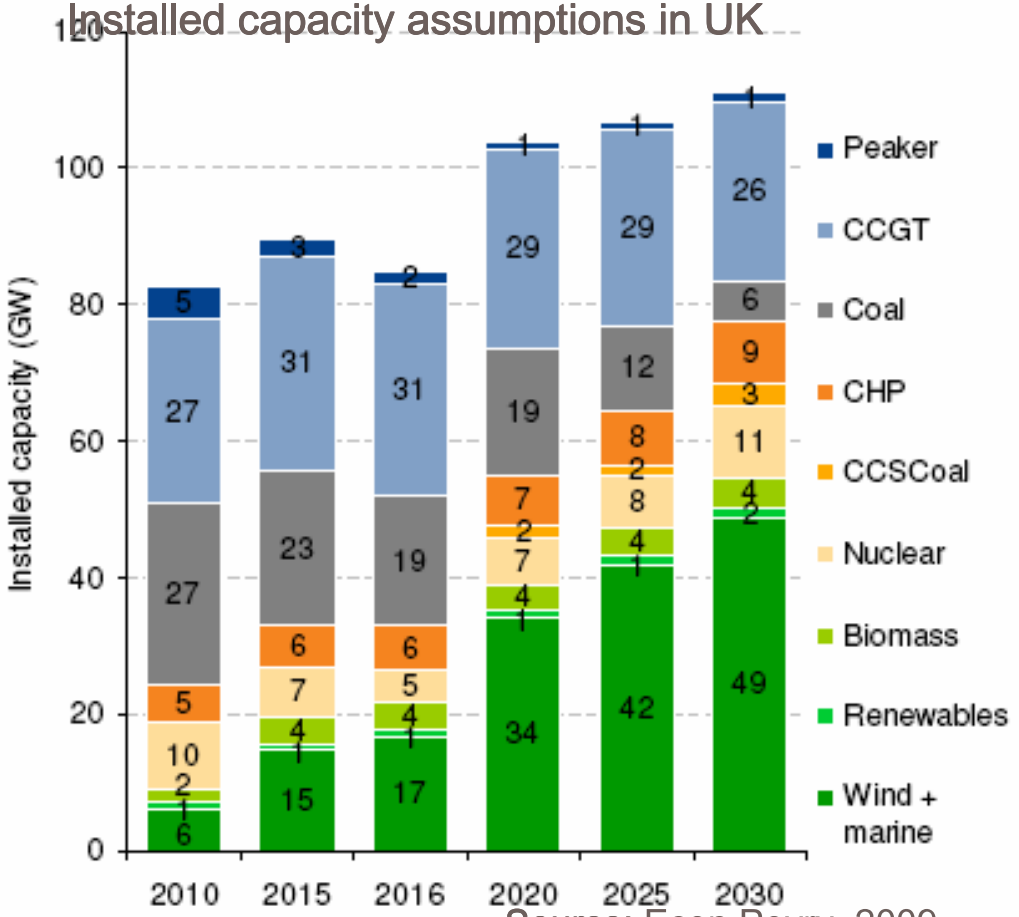
# Europe is optimistic for wind, and Britain perhaps most

Scenarios for Wind Generation Capacity in Europe (GW)



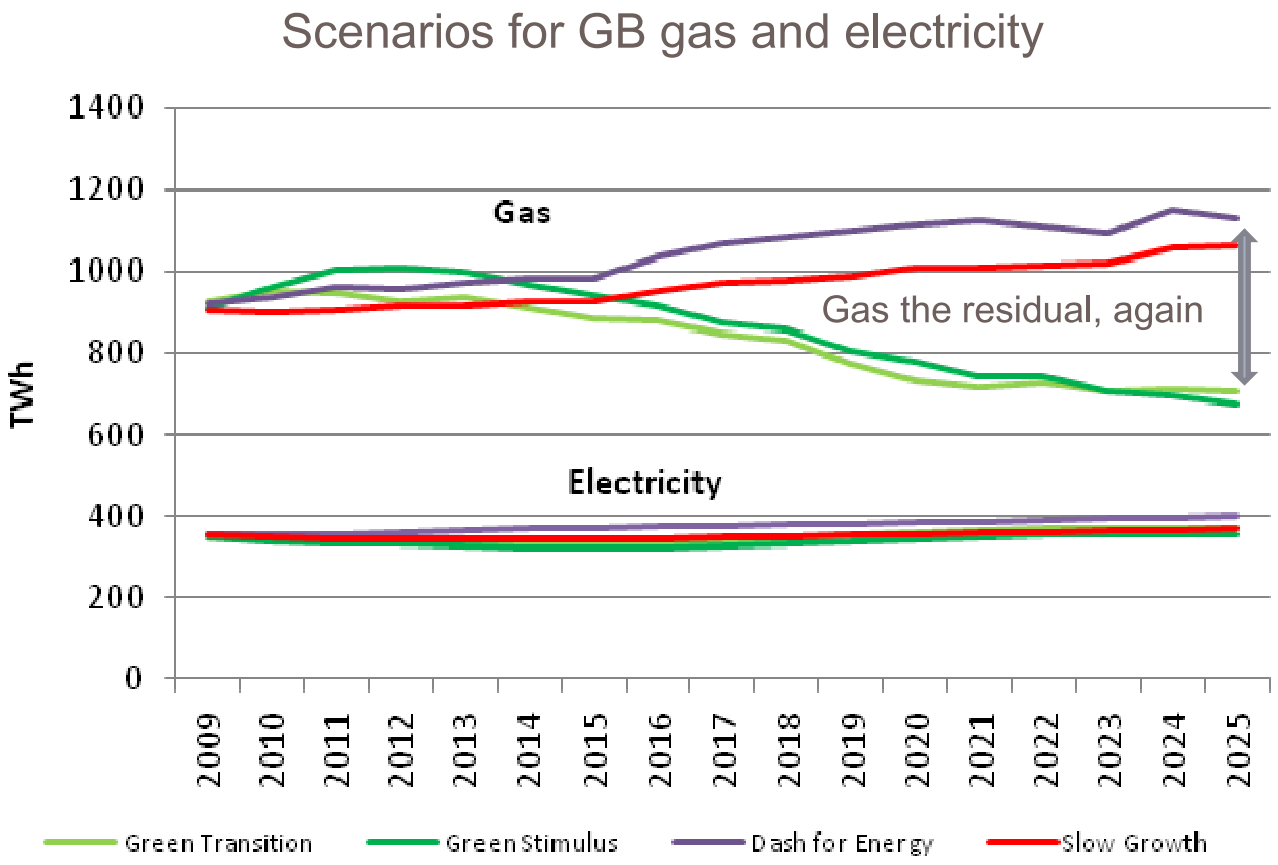

Source: EWEA, 2008

Installed capacity assumptions in UK




Source: Econ Poyry, 2009

# Ofgem sees on the role of gas falling in shades of green…




**Source:** Ofgem, October 2009

| | | Economic recovery | |
|---|---|---|---|
| | | Rapid | Slow |
| Environ-mental action | Rapid | **Green Transition** | **Green Stimulus** |
| | Slow | **Dash for Energy** | **Slow Growth** |

# So, less gas will be needed than previously believed

**Less gas to base load power generation than expected**

- Also possible reduction in gas to industry and households with efficiency drive, bio push and emission reduction

**Some need for gas peaking capacity – but less predictable**

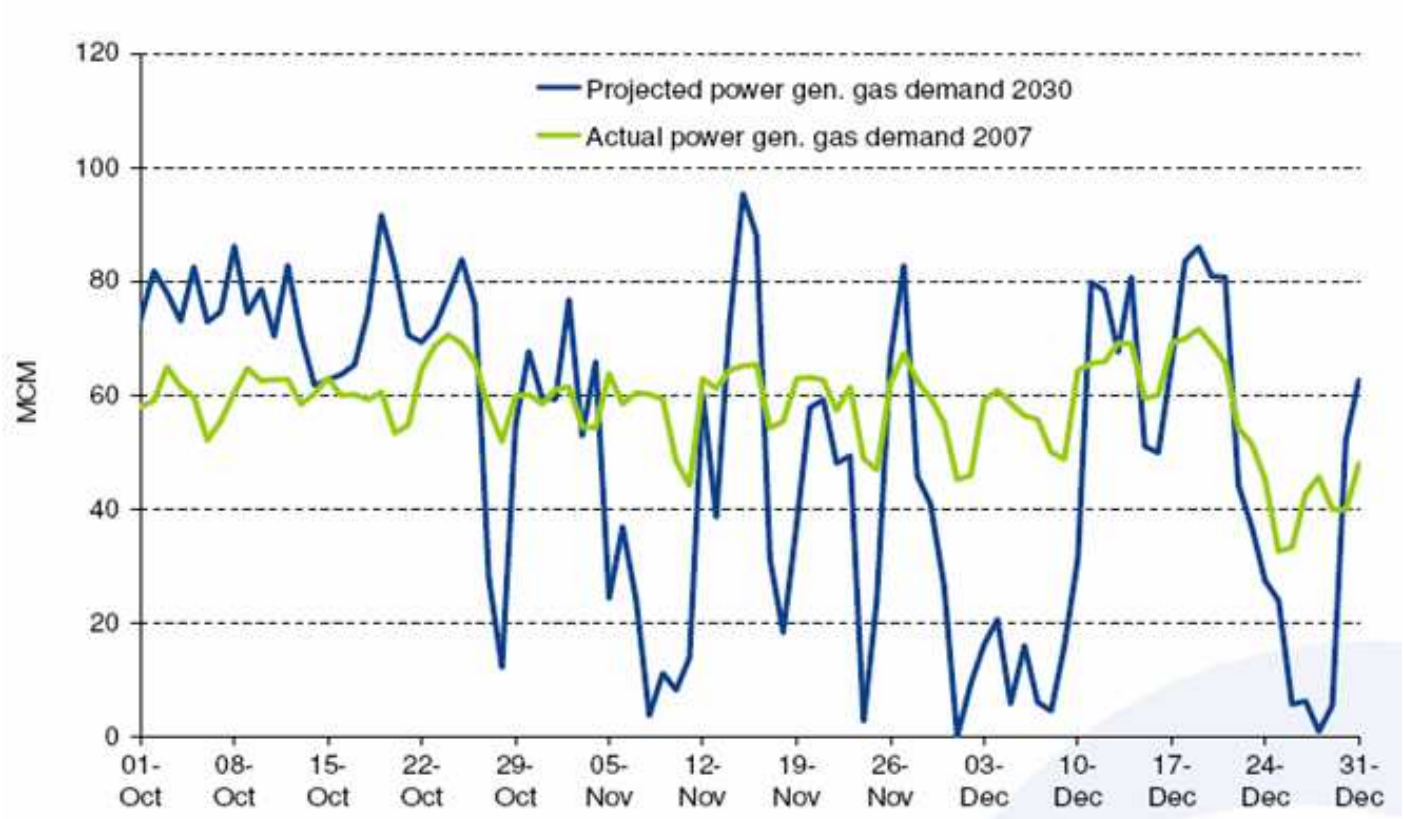
- Requires higher use of storage for modulation
  - Financed by peak prices
  - Is there enough capacity, or is more needed?
- Requires attractive prices to power generation
  - Cheaper than alternatives, easily available on demand (agility)

**Opportunities for some in trading, risk management and modulation**

- More probable role for power players than for oil companies?

# …and wind will change gas load factor dramatically

Load factors of gas in UK 2030 with planned wind




**Source:** Econ Poyry, 2009

# ...and that's not all for gas!

**Recent security of supply scares as well as price have been bad for gas**

- Not necessarily "fuel of choice" any more
- Many large buyers concerned, and so are politicians
- This impacts investment preferences in supply and use of gas

**20-20-20 makes gas the residual**

- Power generation: For balancing not met by electricity imports?
- More use of biogas in system: clean, domestic and secure
  - Either "decarbonising the gas grid" or being used directly for CHP or vehicles
  - Coming in as base load, often with priority/preference, displacing some natural gas

**Security of supply measures will also impact load factors**

- At Eastern interruptions, Western gas should be able to flow East, requiring more agility from natural gas flows and systems
  - All EU TSOs' systems to be reversible in two years
- Greater focus on storage – both for SoS and balancing

# There is plenty of gas in the world – where will it go?

**We have been used to Europe being an attractive market for gas**

- Economic growth, environmental focus to replace coal and nuclear
- US spot uncertainty and Asia emerging economies
- Good credit ratings and “clean” economies
- Long base load contracts linked to oil

**Current image of Europe to some of the more distant suppliers could be**

- Recession, overly environmental focus away from gas, credit risk
- Chaotic, uncertain market with volatile prices

**Increasingly, China and Latin America are sailing up as new favourites**

- Economic growth, environmental focus to replace coal and nuclear
- Good credit ratings and “clean” economies
- Long base load contracts linked to oil

# How much more infrastructure is really needed?

**Growing baseload demand easy**

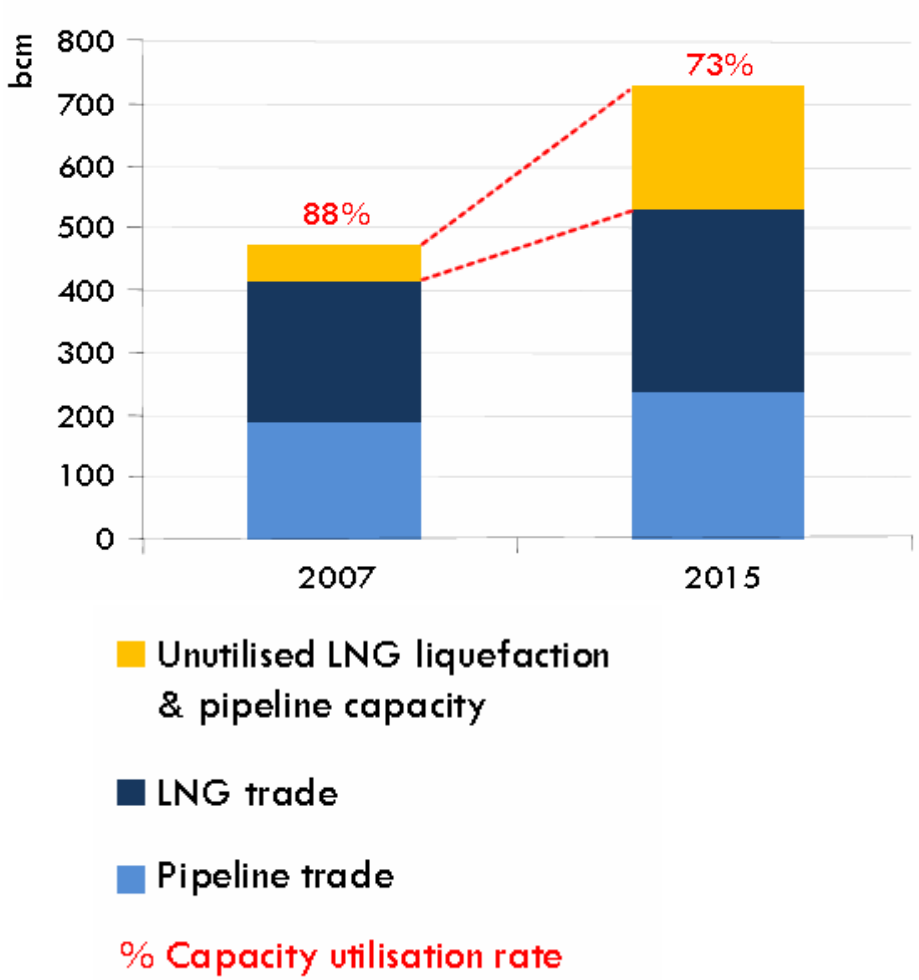
- Long term contracts in pipelines or LNG are seen as acceptable
- Growing LNG capacity, some without long term contracts
- Long lead times are a challenge
  - Especially in uncertainty!

**Who pays for the over capacity?**

- SoS premium?
- Different weighting of capacity and commodity?

**Is it realistic to have gas as the residual – if it implies no income to infrastructure?**

Natural gas transport capacity – global outlook




Source: World Energy Outlook, 2009

# So what do we want?

**Does Europe want gas to play a role – if so, for how long?**

- Is the "bridge to the future" getting shorter and narrower than we thought?
- Large investments in new infrastructure need to be sustainable
  - Long term, good payability – easier with LNG than pipelines?
- Pricing and risk management will be important
  - Asking a seller to take your risk could get too expensive!

**Do large gas producers want to be attractive to Europe – if so, how?**

- More flexible supplies of gas?
- Security of supply products
  - Easier with LNG than pipelines?
- Other tricks?

**Yes, the market will show us…**

- But maybe we should be prepared?
- Sustainable and realistic solutions?


PHOTO COURTESY OF WWW.LNGONEWORLD.COM

# Happy to discuss further!

**Sund Energy AS**
**N-0257 Oslo**
**Norway**

**Karen Sund: +47 91786928**
**Karen@sundenergy.com**

**Presence in Stockholm, Helsinki, Rome, San Francisco, Dubai**
**Focus on commercial and strategic aspects of gas, power and CCS**