KUALA LUMPUR 2012 WORLD GAS CONFERENCE

25th world gas conference

"Gas: Sustaining Future Global Growth"

The dwarf that will change the world

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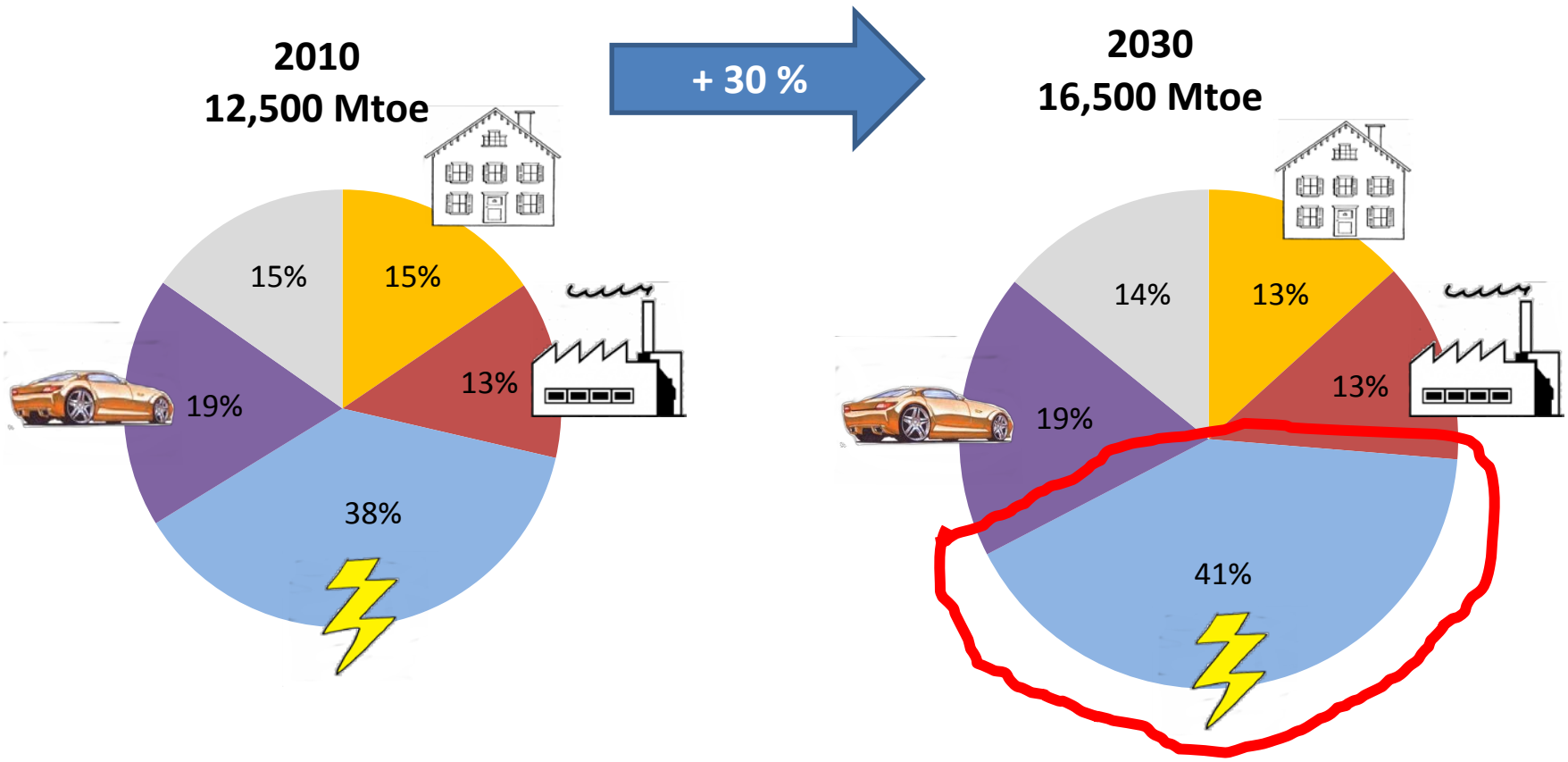
World Gas Supply, Demand & Trade
Date: Tuesday 5 June, 2012
Venue: Plenary Hall

Patron: IGU International Gas Union / Union Internationale du Gaz

Host: Malaysian Gas Association

Host Sponsor: PETRONAS

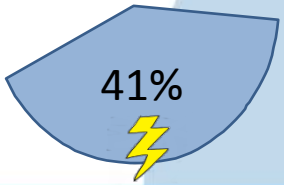
Global Primary Energy Growth

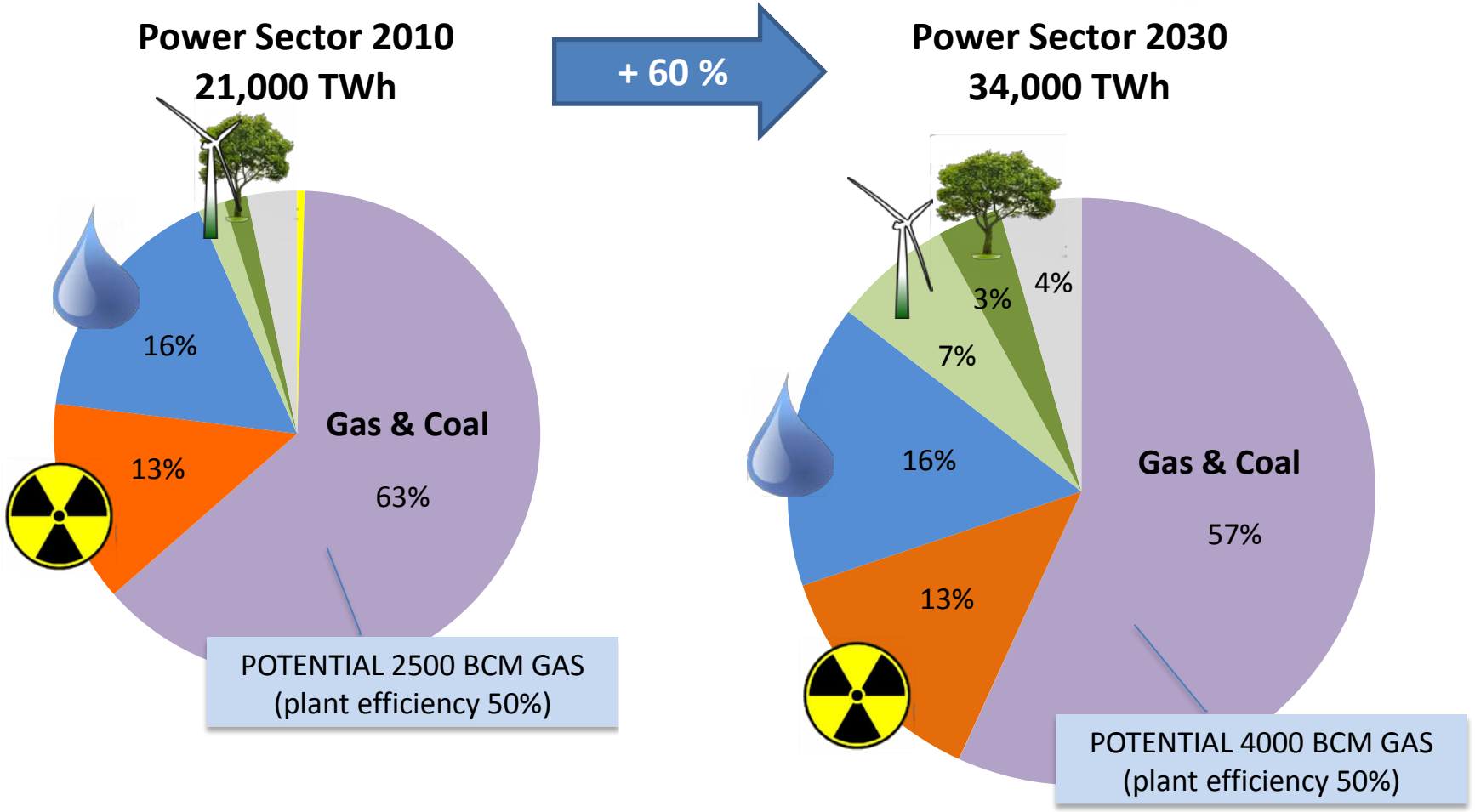


- **Primary energy growth 30% within two decades**
- **Focus on main driver: Power Sector**

Sources: IEA- World Energy Outlook 2011, IGU 2012

Global Power Sector Growth

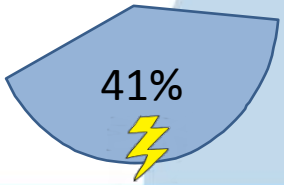


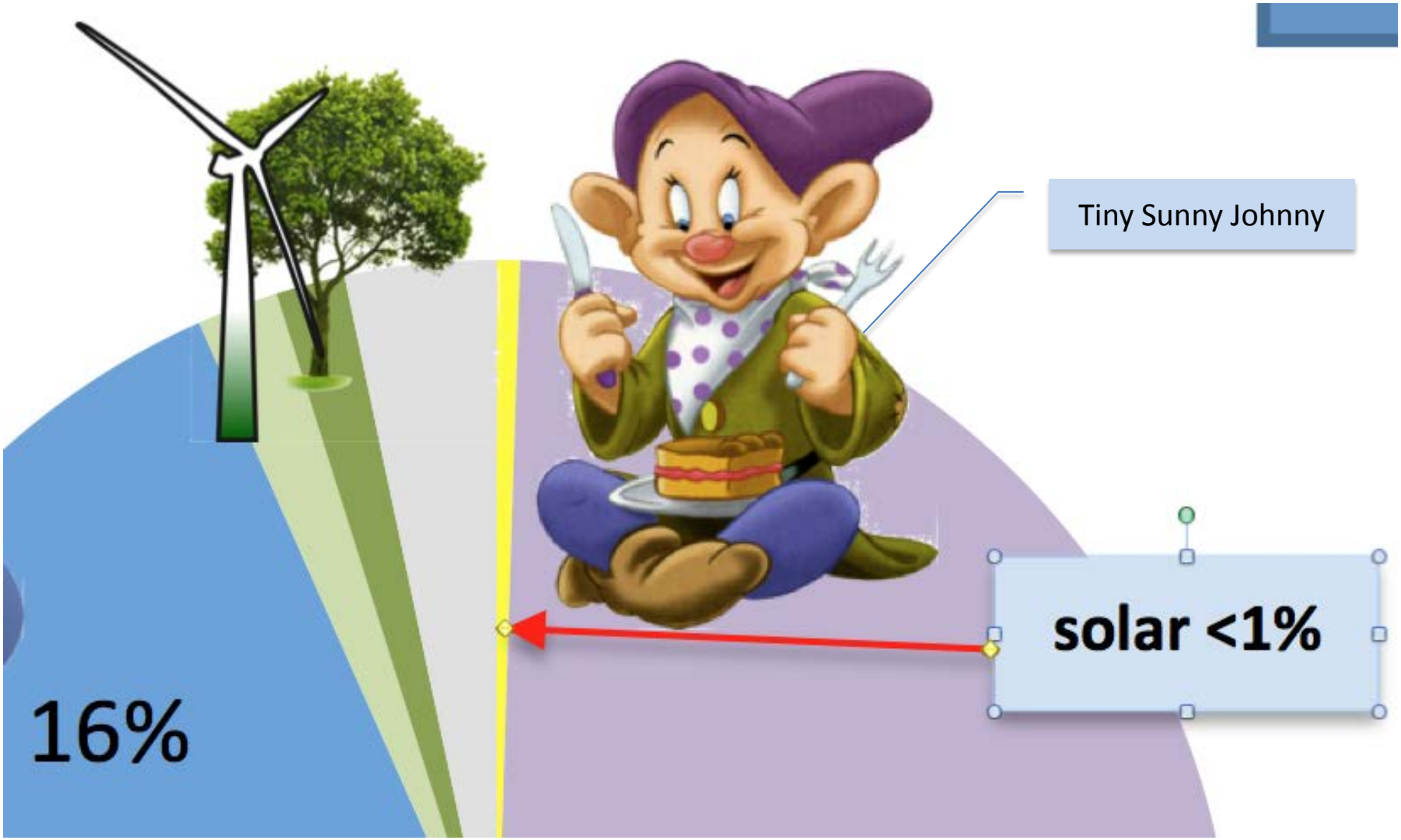


- **Power Sector growth 60% within two decades**

Sources: IEA- World Energy Outlook 2011, IGU 2012

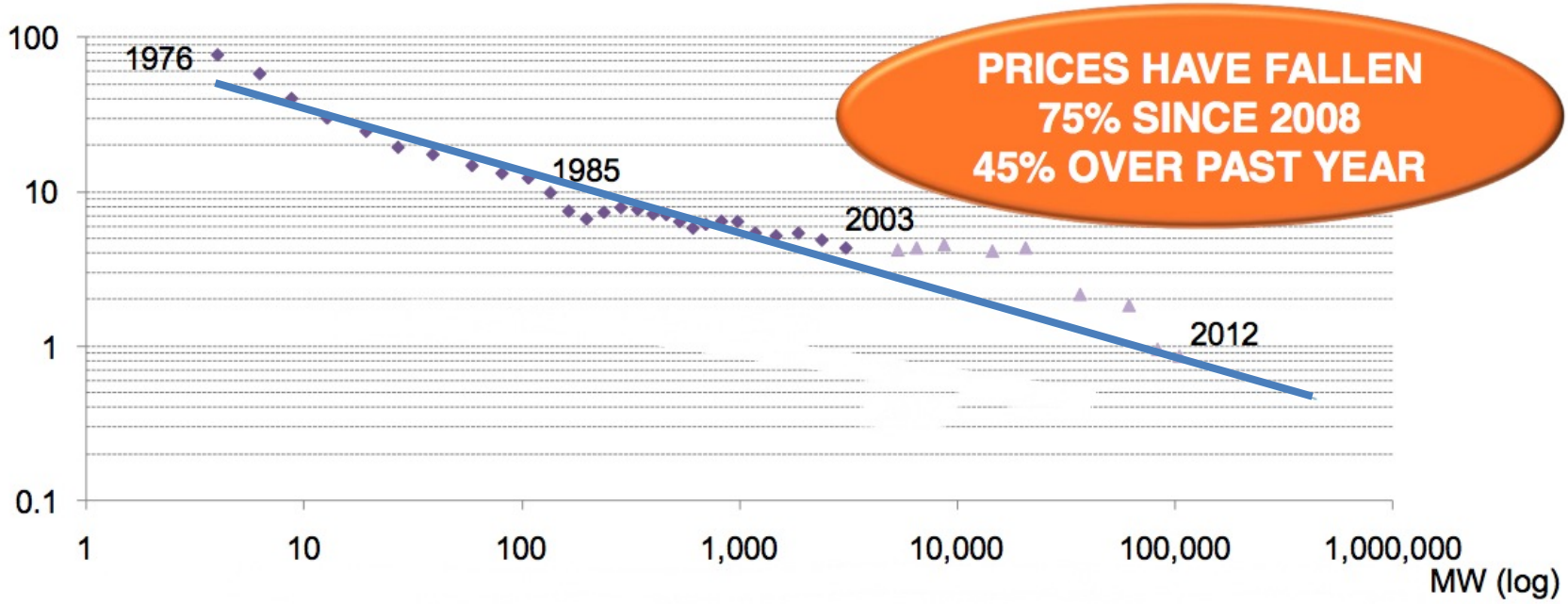
Global Power Sector Growth





Solar Energy (PV) Cost Development

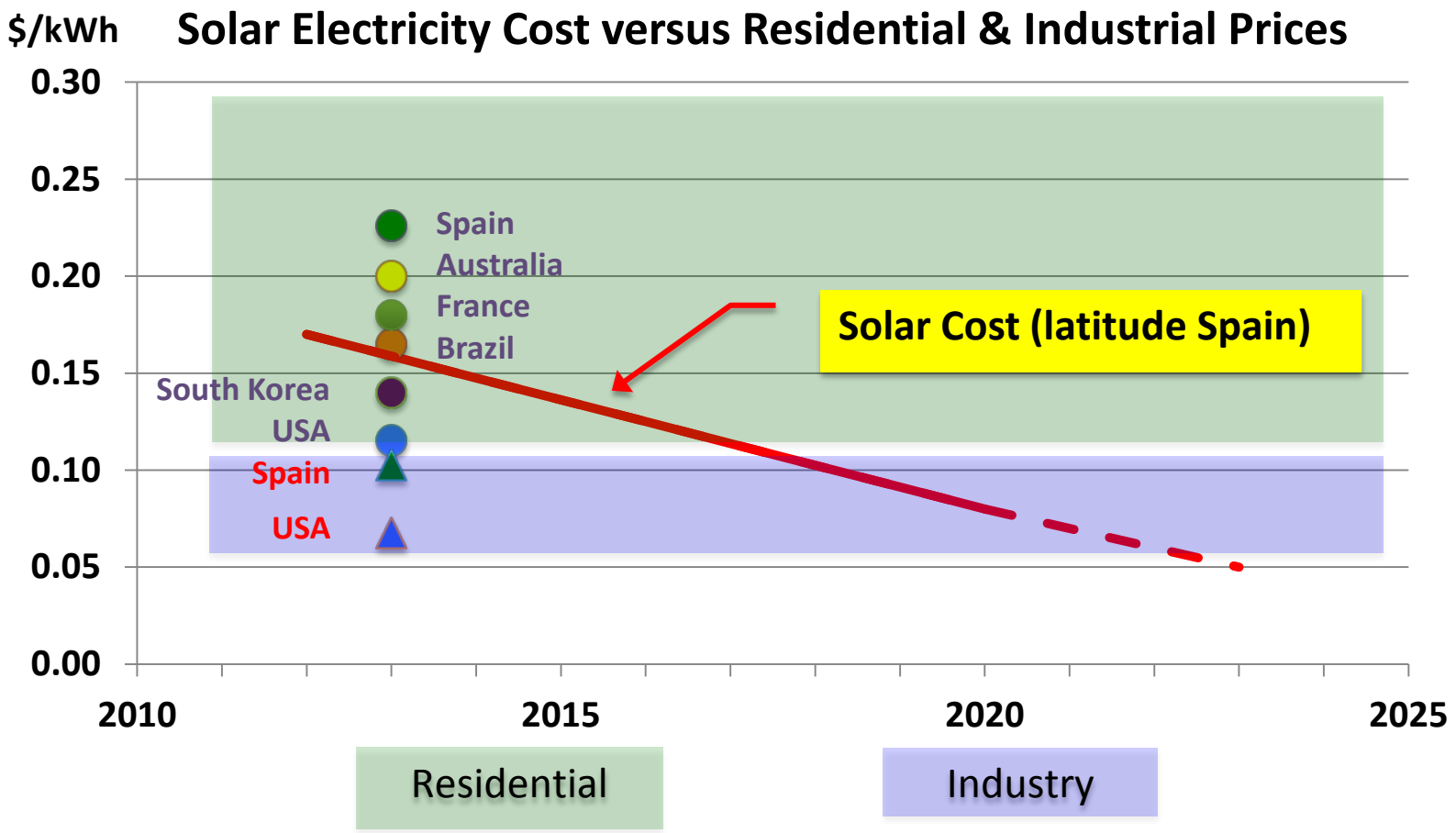
THE PV MODULE EXPERIENCE CURVE, 1976–2012 ($/W)



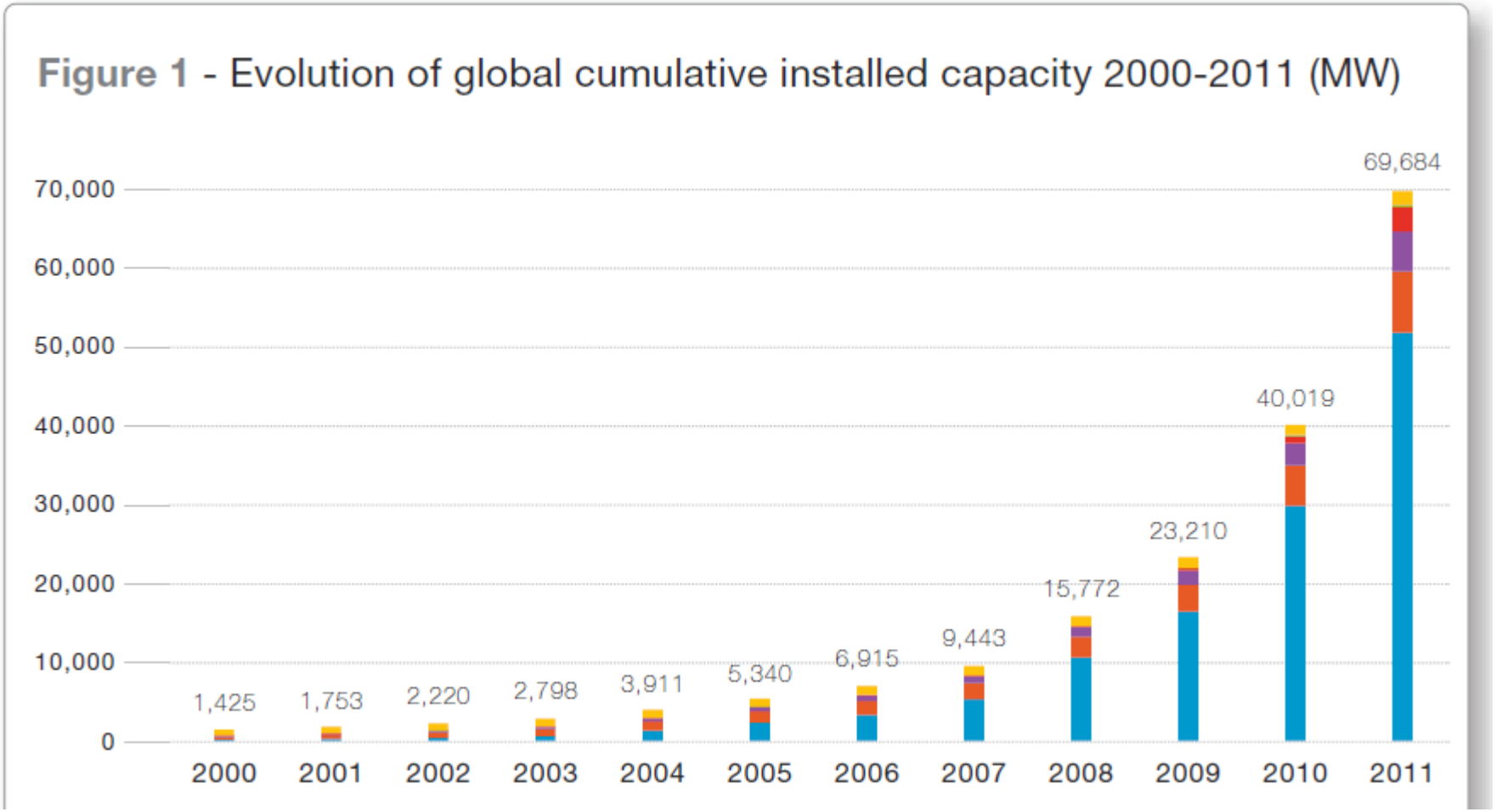
Source: Bloomberg New Energy Finance

Source: Paul Maycock, Bloomberg New

Solar Energy Impact on Loadfactor

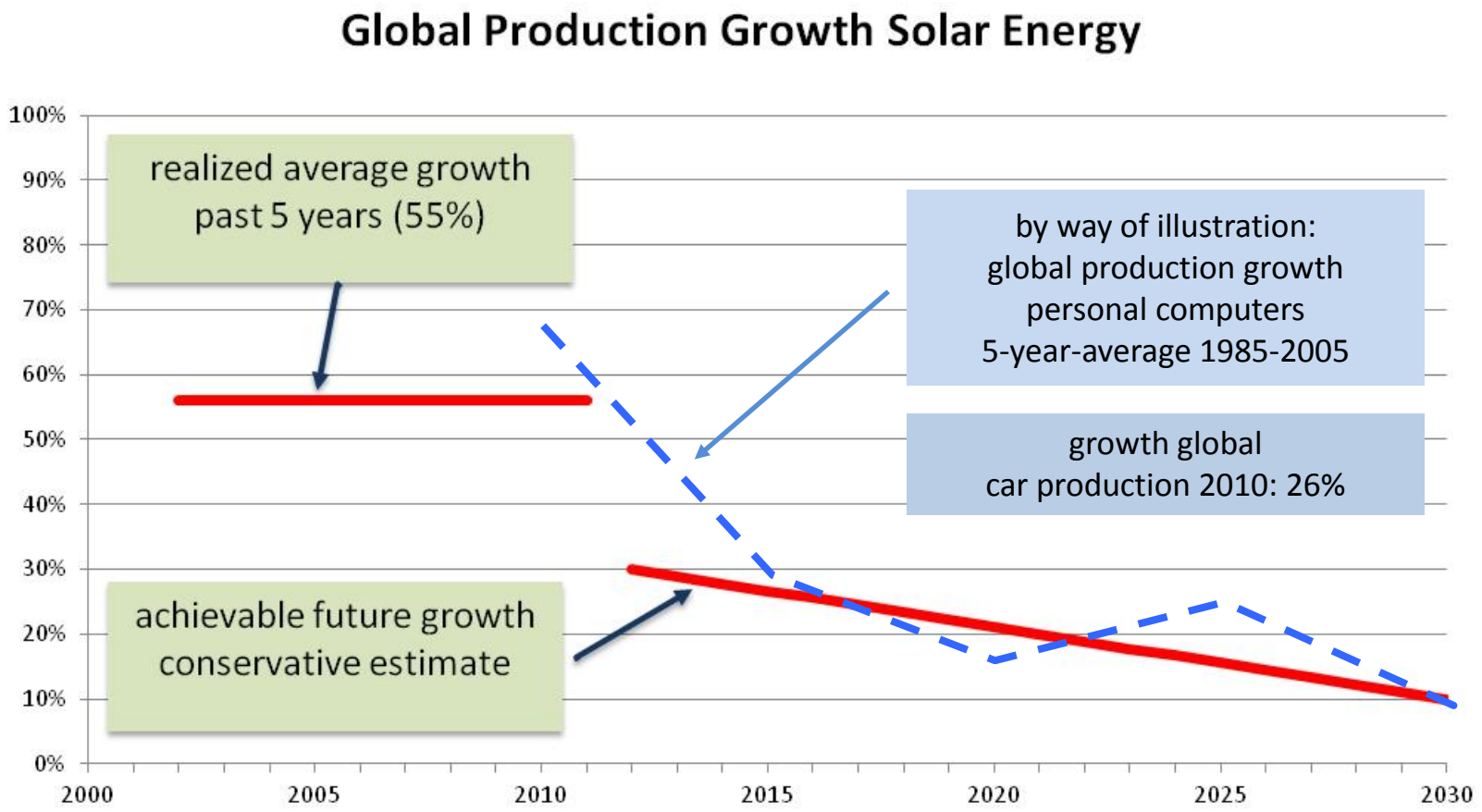


Global Installed Capacity Solar Electricity (PV)

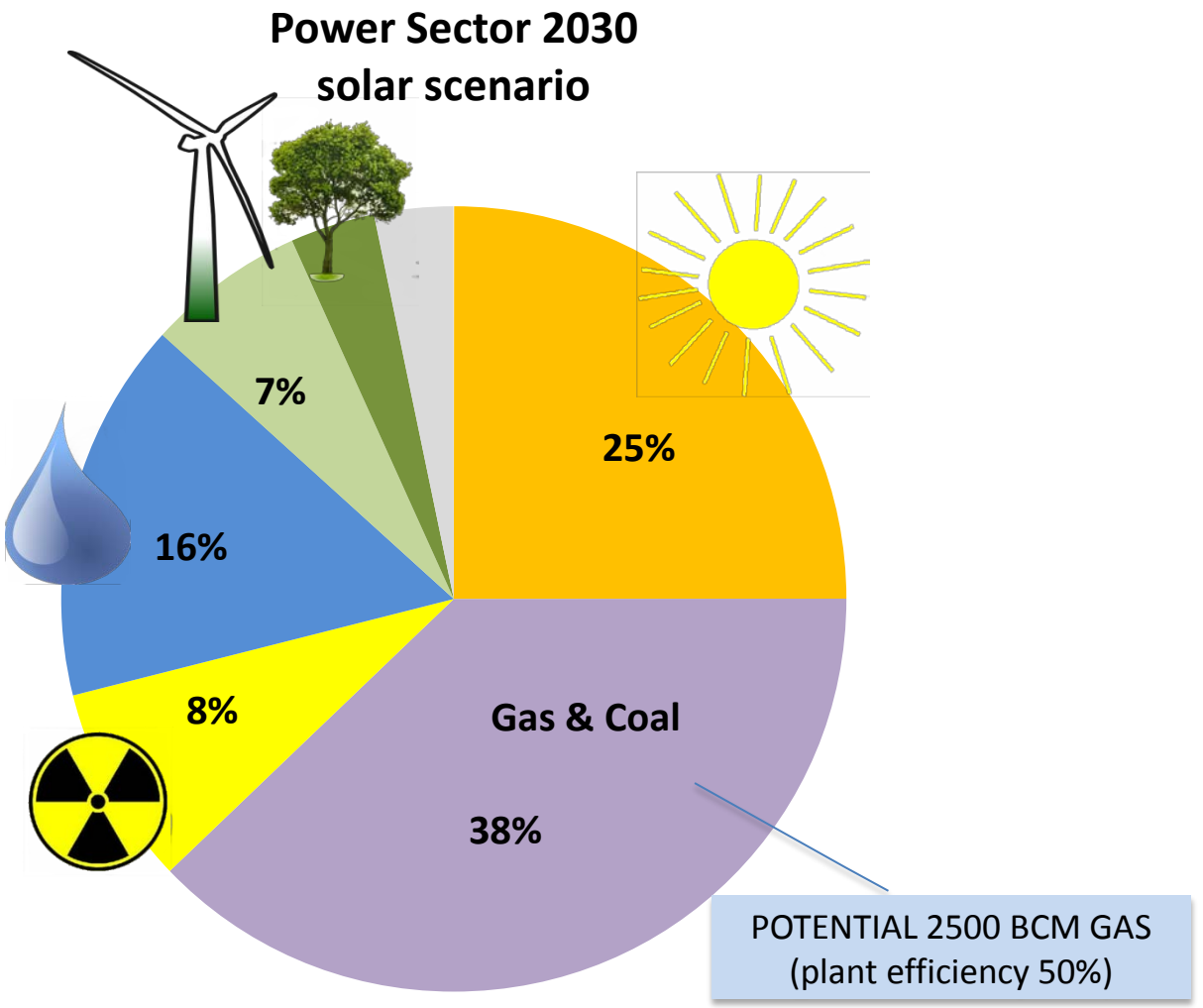


Source: PV Global Market Outlook – EPIA, May 2012

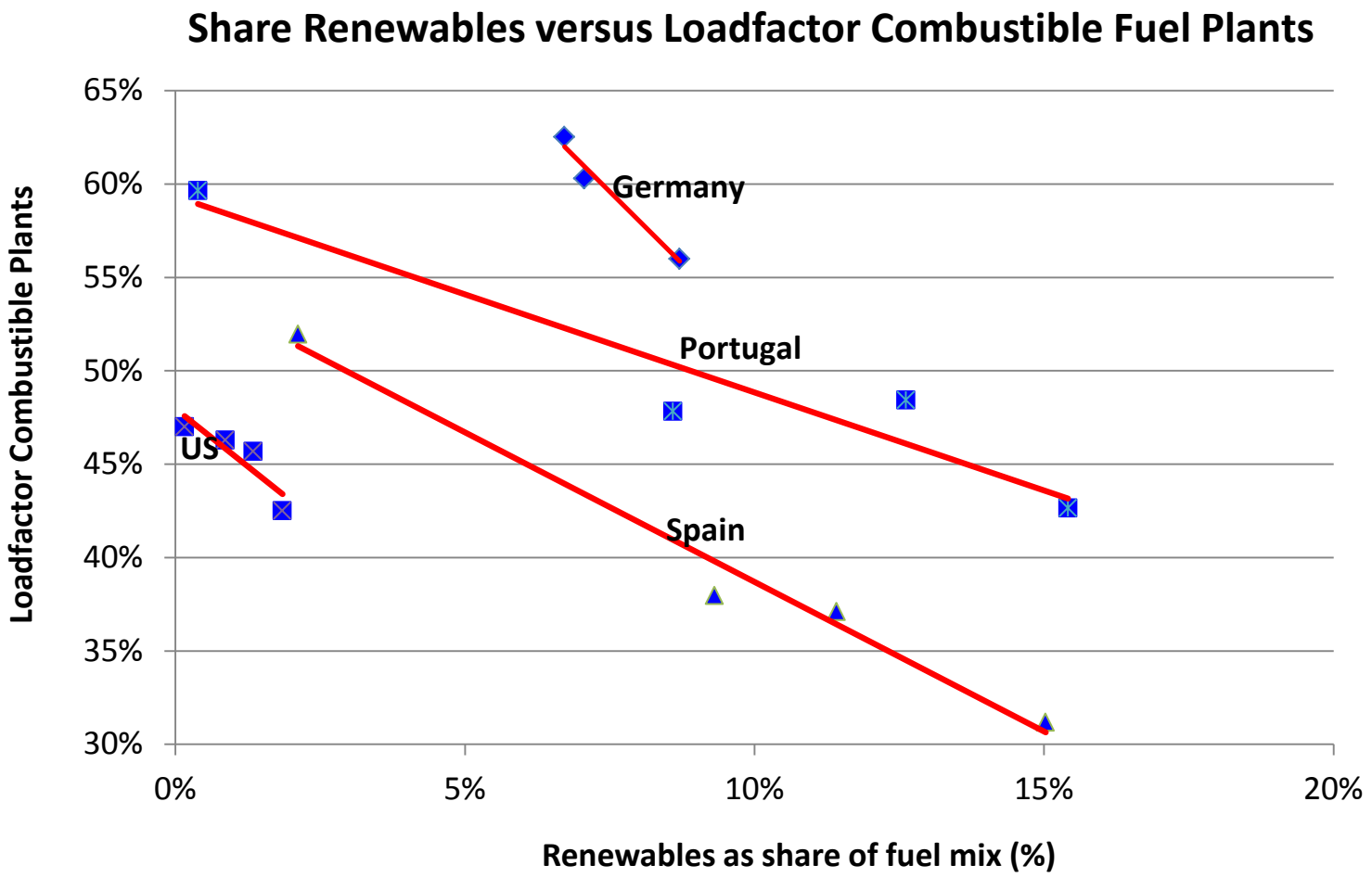
Global Production Growth Solar Electricity (PV)



Power Sector 2030 – Solar Scenario

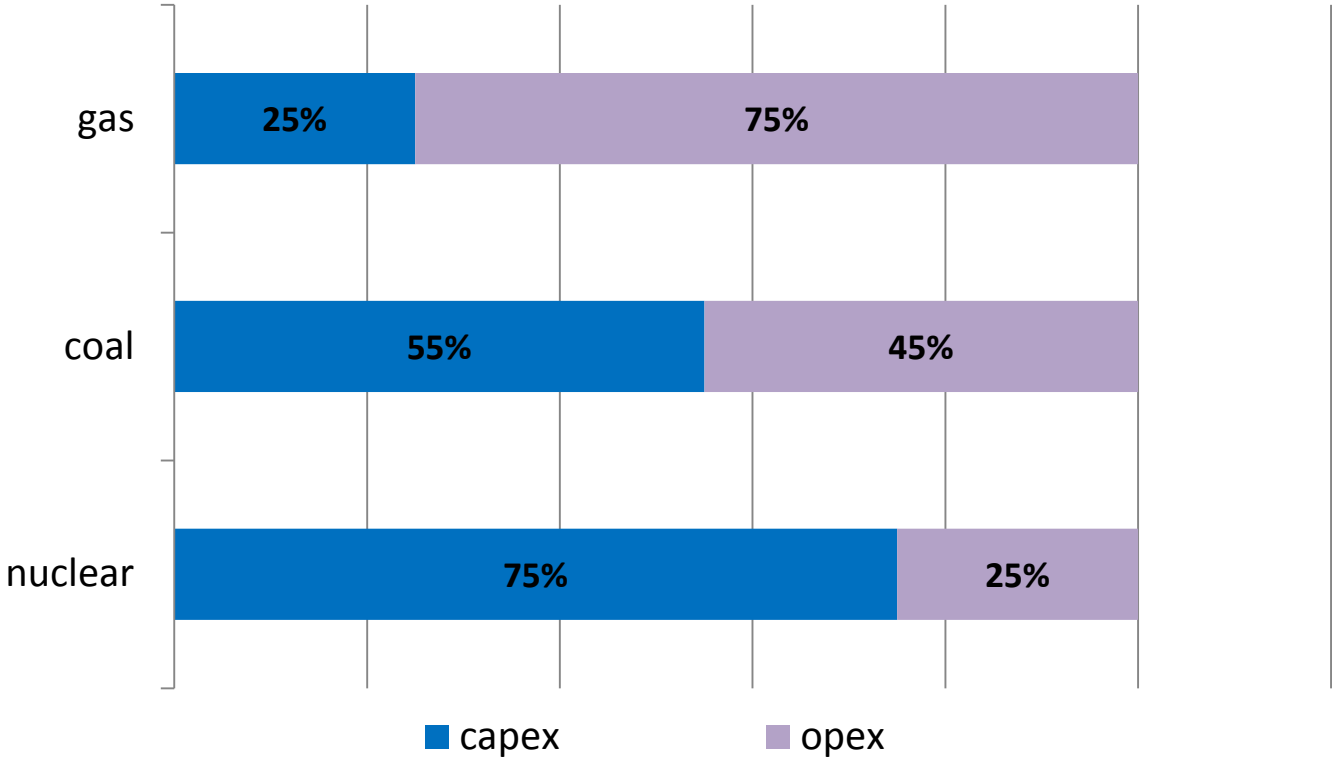


Impact of Renewables on Loadfactor Power Plants



Sources: IEA- Electricity Information 2011

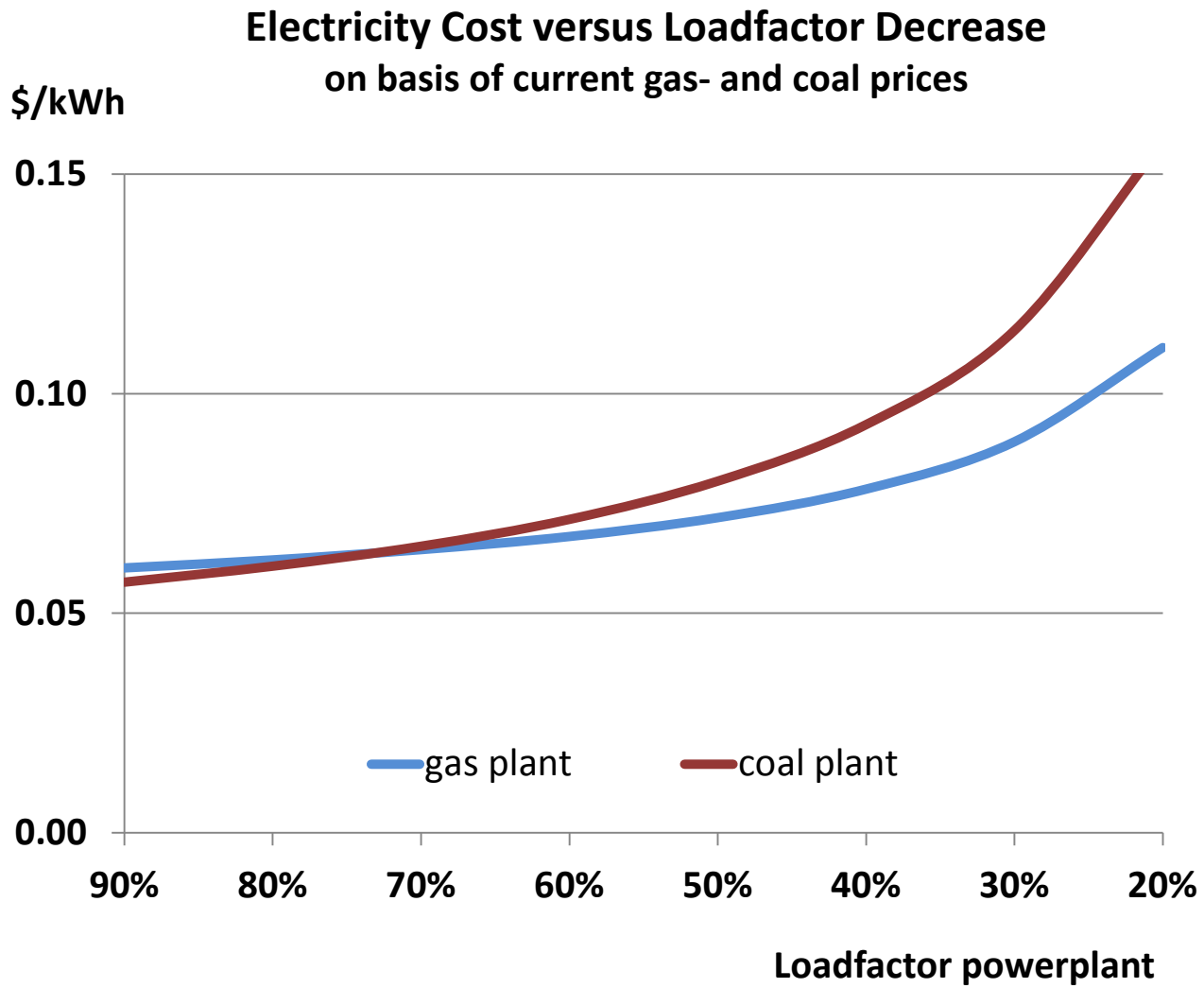
Capex-Opex Ratio Power Plants



Decreasing loadfactor gas plant has relatively low impact on kWh-cost

Sources: IEA/NEA- Projected Cost of Generating Electricity - 2010

Impact on Electricity Cost through Loadfactor Decrease



Conclusions

- Solar Energy will play an increasing important role in the power market
- Photo Voltaic Electricity (PV) will have grid parity for industry within a decade
- Utility parity will most probably be reached before 2025
- The dwarf will consume a significant share of the power pie and grow to a giant player
- Nevertheless, the transition period towards a sustainable energy supply will take several decades
- Loadfactor of combustible fuel plants will decrease dramatically
- Investment climate for coal and nuclear plants will deteriorate
- Capacity will become more expensive

Gas is in the best position to supply the power market (together with renewables) for a long period