



What should replace MoneyPoint?

Richard S.J. Tol, Seán Diffney
and Laura Malaguzzi Valeri





Motivation

- By 2025 Ireland will need to replace its large coal plant in Moneypoint
- Power stations take a long time to build and last for a long time.
- 2008 All Ireland fuel mix:
 - ~60% natural gas
 - ~20% coal
 - ~7% peat
 - ~6% wind



Questions

- What is the effect on costs?
 - What is the effect on prices?
 - What is the effect on emissions?
 - Are there issues of security of supply?
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- Uncertainty about fuel prices (60-110-160 \$/bl), interconnection (900-1400-1900 MW), wind penetration (2000-4000-6000 MW), carbon price (20-50-85 €/tCO₂)



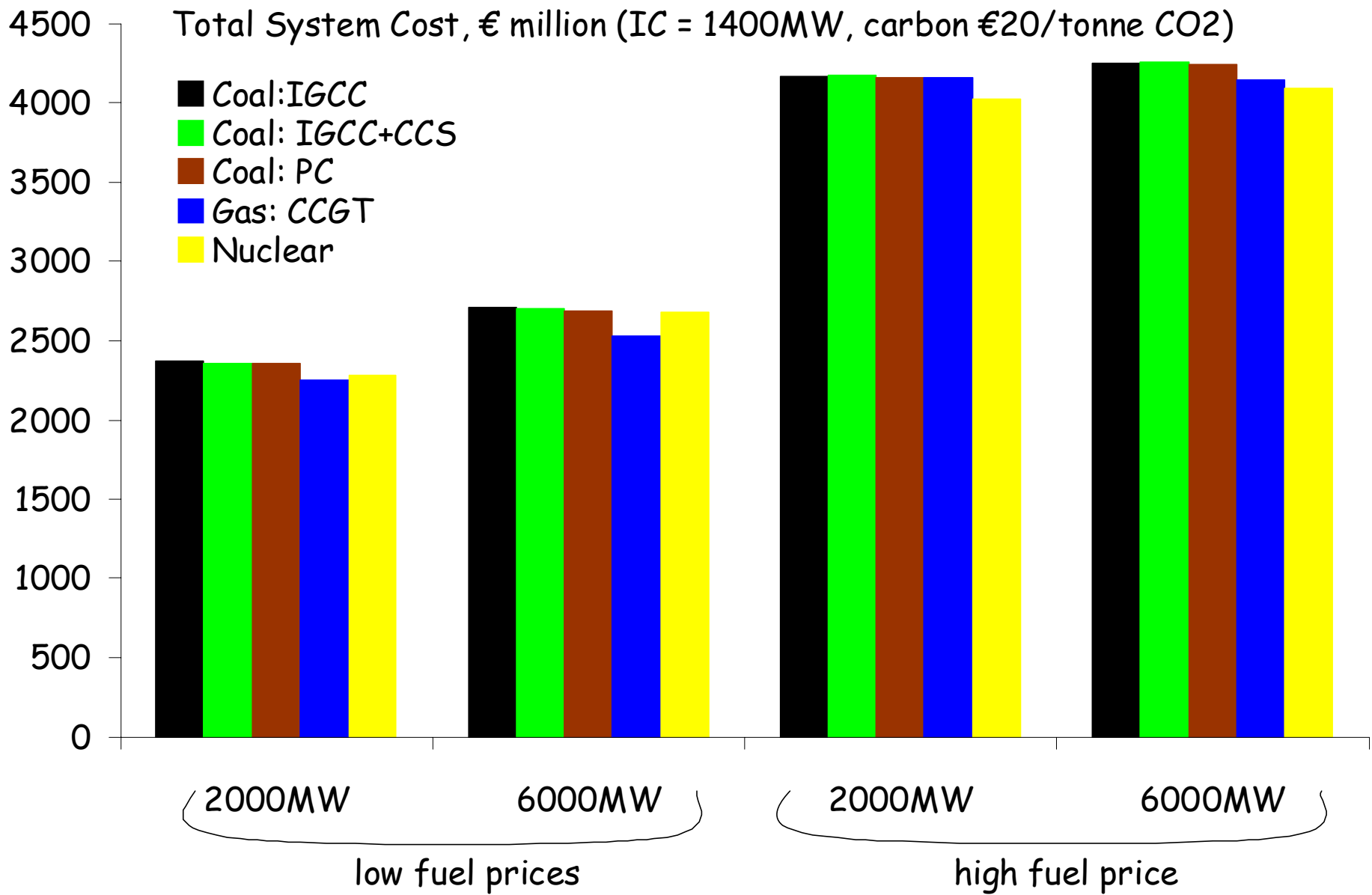
Key assumptions

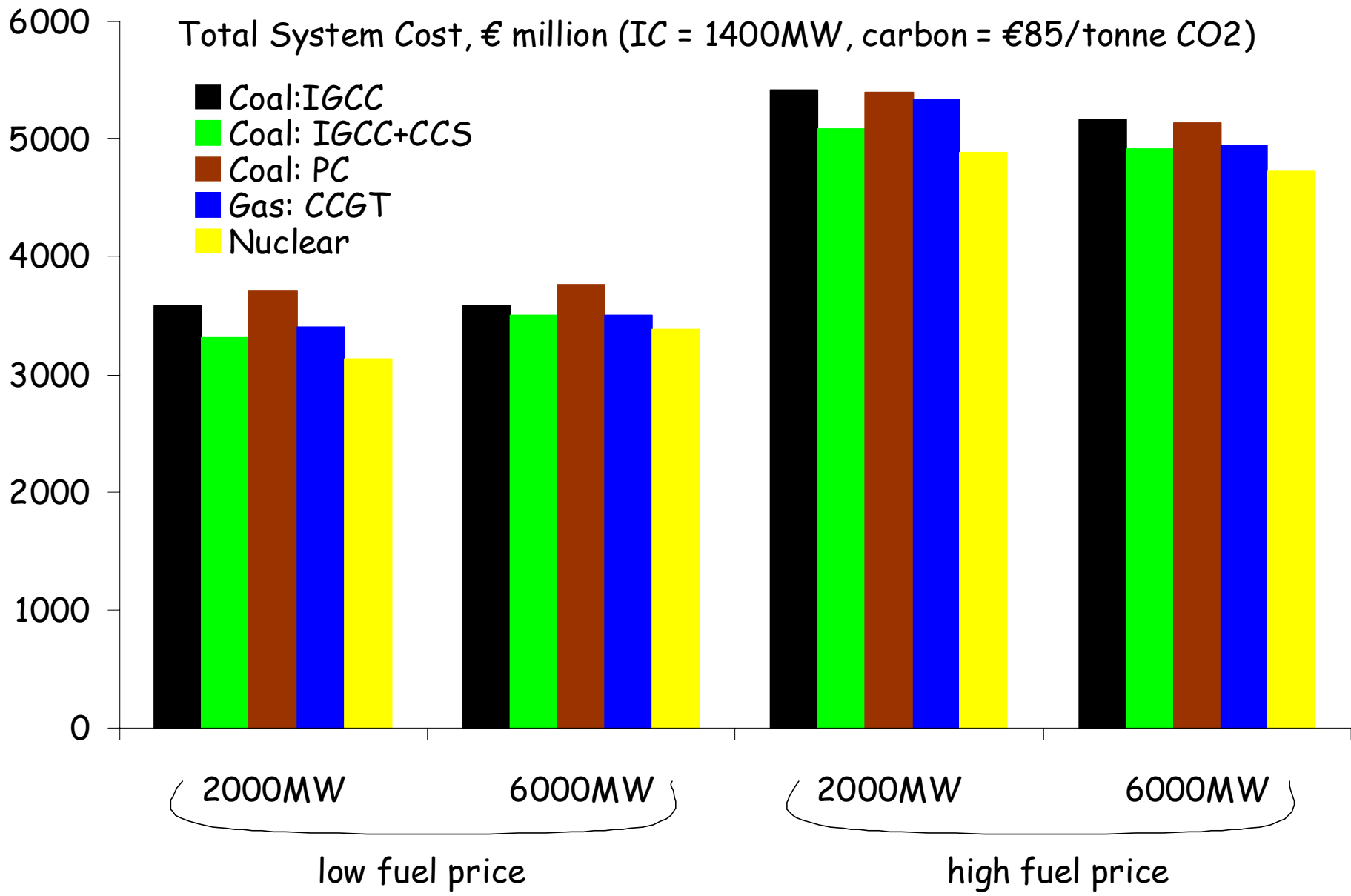
- No transmission constraints within systems
- No ramping costs for thermal plants / wind curtailed
- Interconnector as perfect arbitrageur
- GB modelled as Ireland - pool with capacity payments - with GB-specific input data
- 2025 snapshot (no dynamic effects)



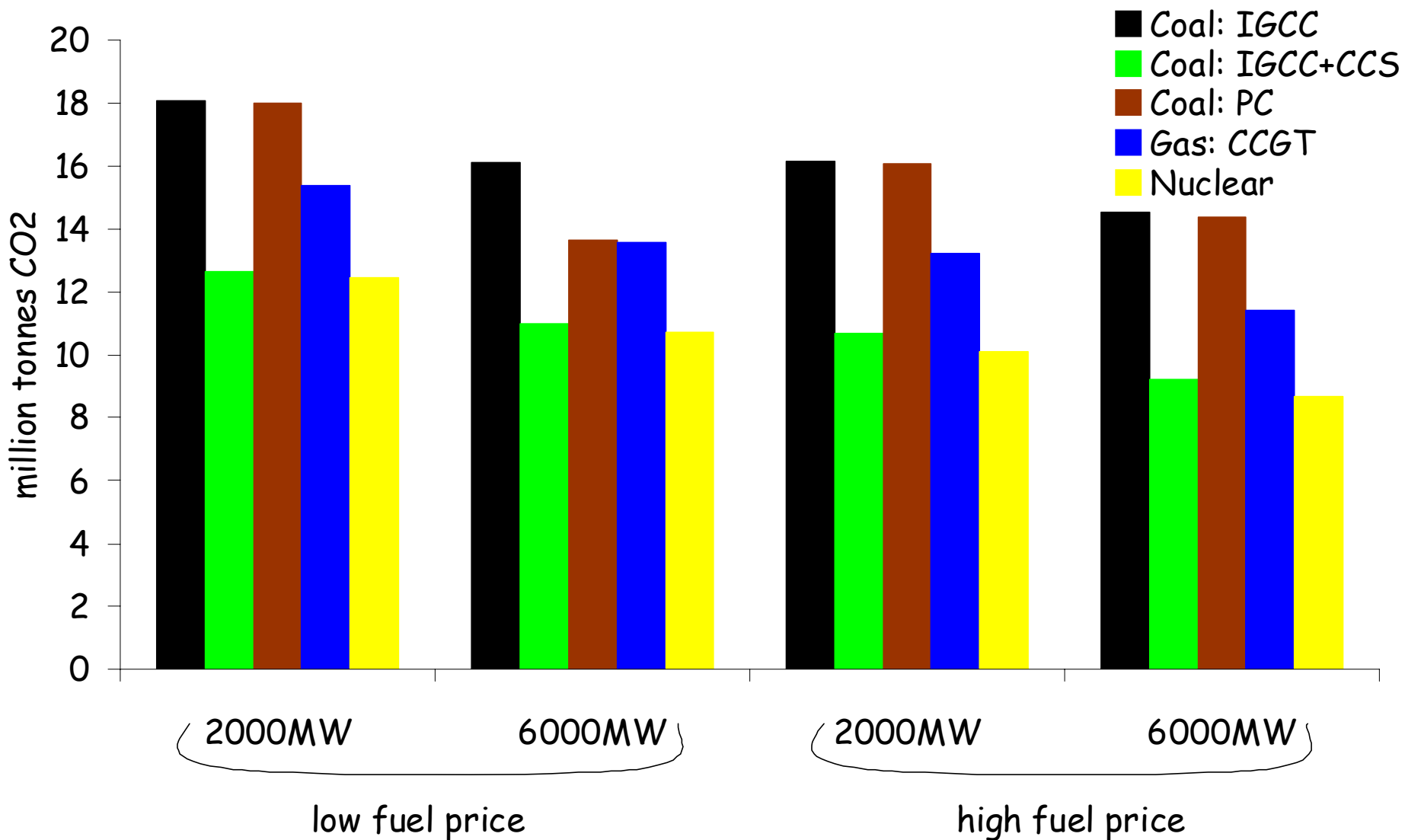
Cost assumptions, 2007€

	Coal PC	Coal IGCC +CCS	Natural Gas CCGT	Nuclear
Cost of Capital %	8	8	8	11.5
Overnight cost (€/kW)	1279	2057	664	3500
Lifetime of plant	40	40	25	40
Availability, yearly %	90	85	89	90
Thermal Efficiency %	46	38	58	33
Waste/Emissions	ETS	CCC + ETS	ETS	€0.91/MWh
Cost uncertainty	1	3	1	3

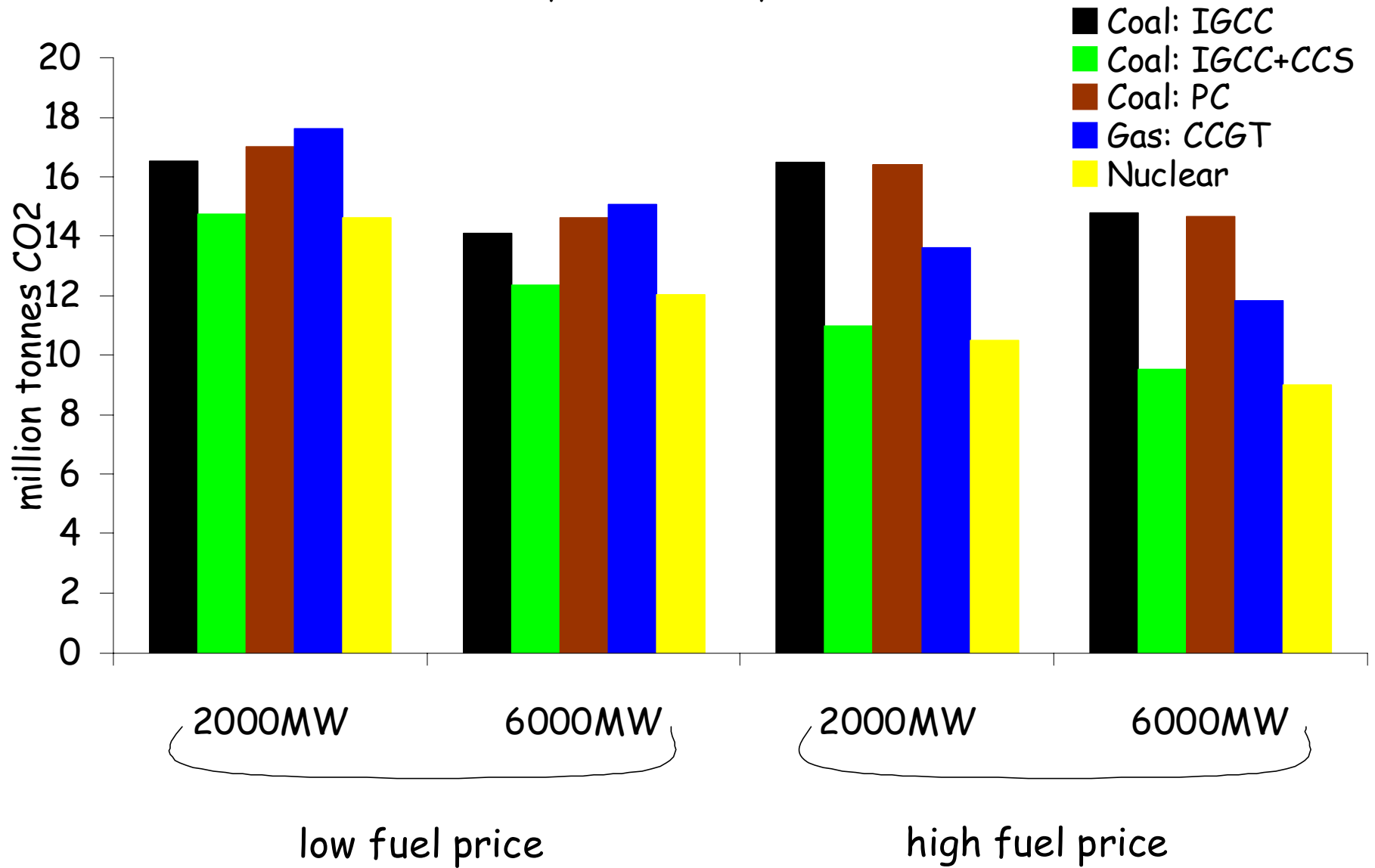




All Island emissions, IC:1400MW, carbon = €20/tonne CO₂



All Island emissions, IC:1400MW, carbon = €85/tonne CO₂





Conclusions

- Carbon capture and storage is commercially viable only if the price of carbon is high
- Coal becomes less attractive as there is more wind, more attractive as the price of gas is higher or there is a higher premium on energy security
- Nuclear comes out well, particularly when combined with interconnection to manage the volatility of wind power, but may be infeasible

