100% Renewables

Will the electricity market work?

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The long term – 100% renewables

- Studies indicate 100% renewables is technically feasible and reasonably affordable

UNSW

Elliston, MacGill, Disendorf (2013) Least cost 100% renewable electricity scenarios in the Australian National Electricity Market. Energy Policy (in press)

Average cost:
$104 - $173 /MWh

AEMO

Australian Energy Market Operator (April 2013) 100 per cent renewables study – draft modelling outcomes

Average cost:
$111 - $133 /MWh

Present average wholesale price: $55 /MWh

2 - 3 times increase in wholesale prices (~30% of retail bills)

Market impacts of renewables

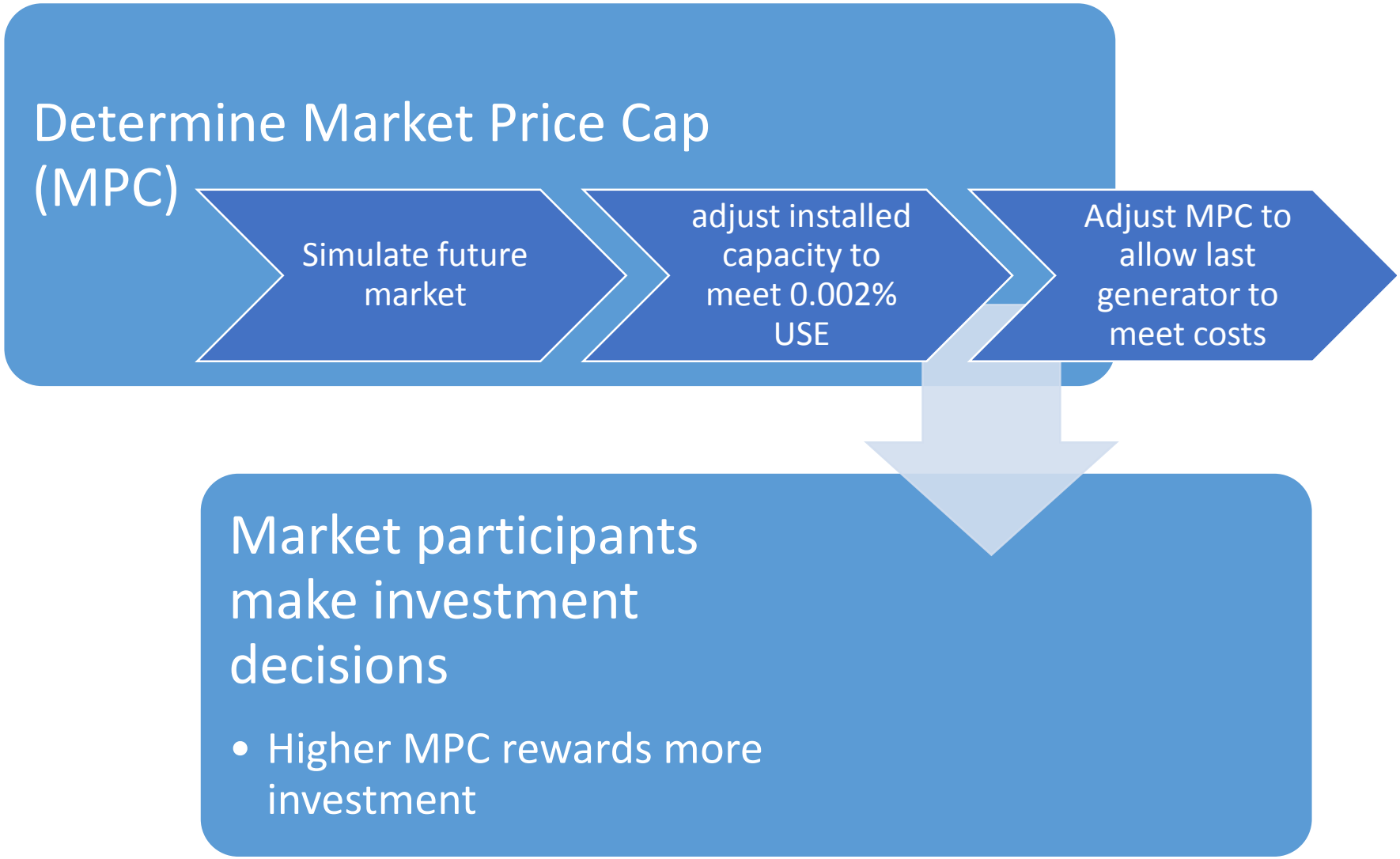
- Will the *market* work with 100% renewables?

How do generators recover costs?

How do we maintain accurate investment incentives?

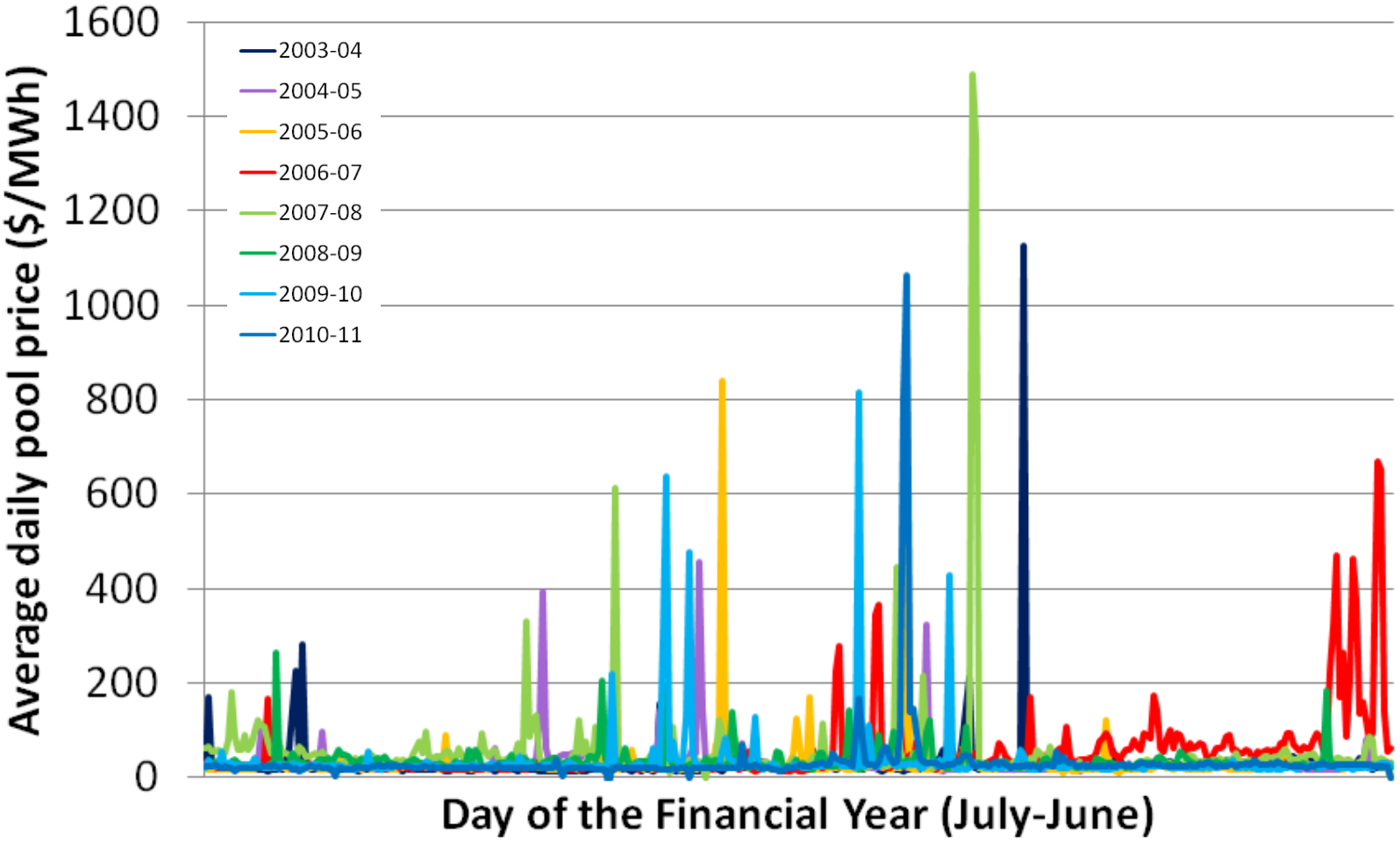
SYSTEM ADEQUACY

Managing system adequacy in the NEM



Price volatility

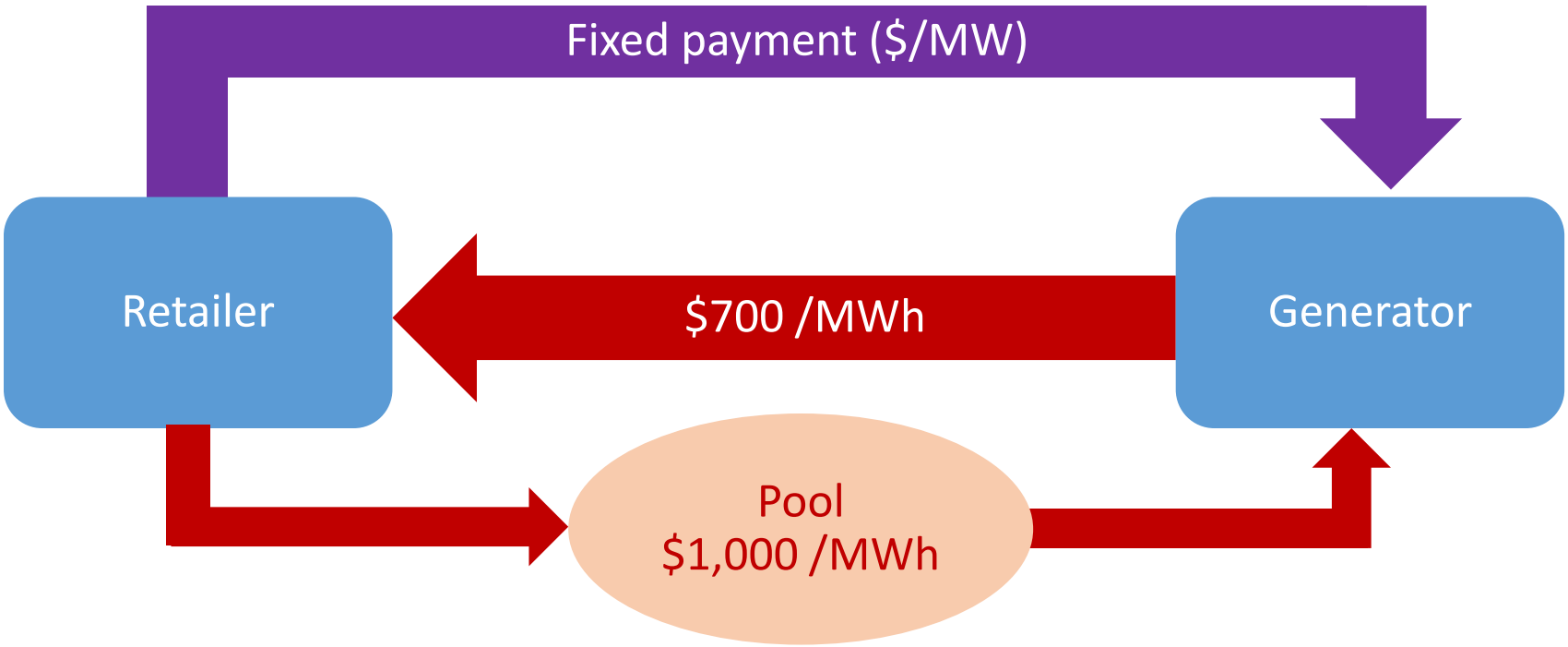
Generators already earn 20-50% of annual revenue in top 20 days of the year



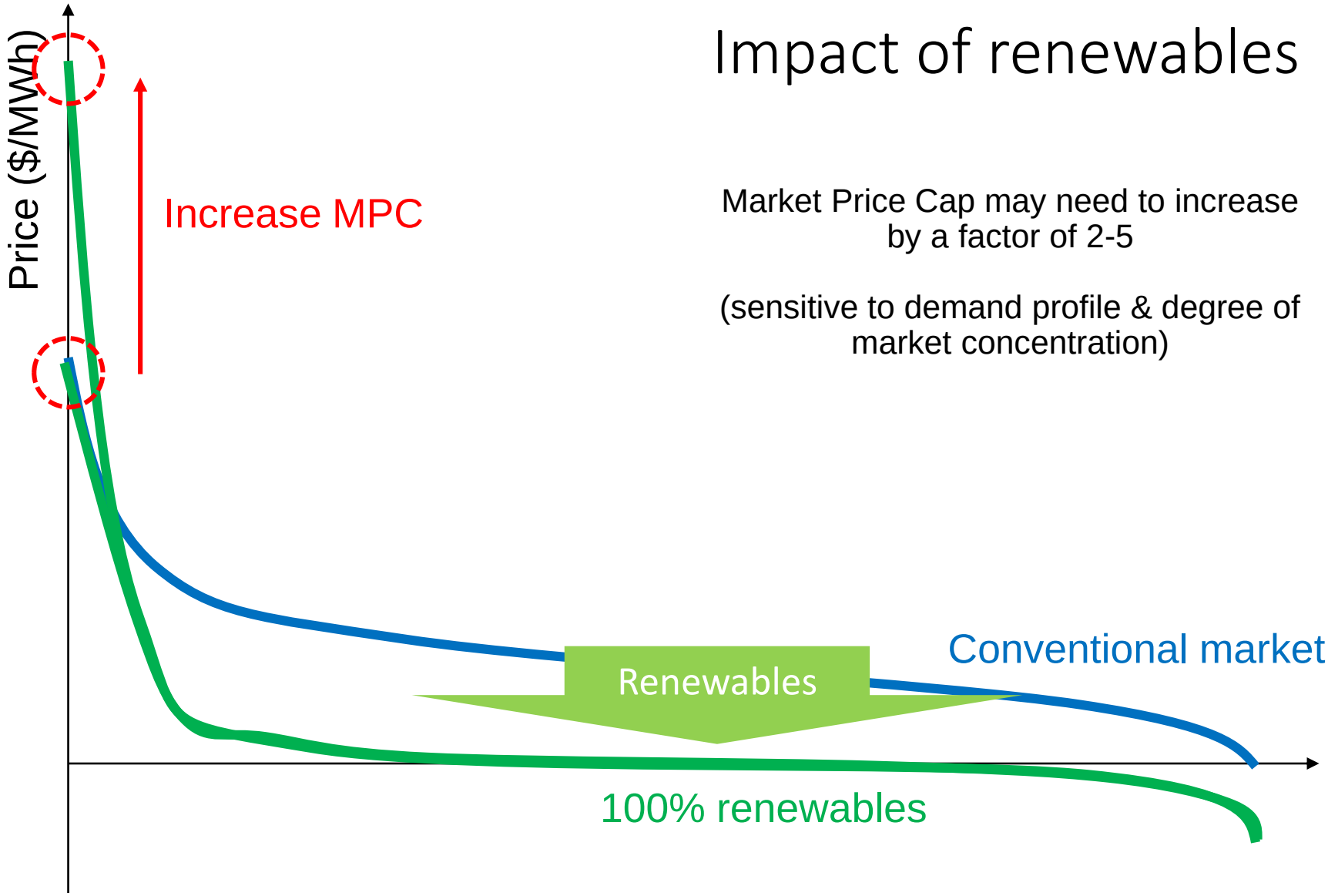
Managing price volatility

- Market participants manage price volatility via:
  - Contractual arrangements – mature derivatives market
  - Vertical integration

Cap contract:
($300 strike price)



Impact of renewables



Market Price Cap may need to increase by a factor of 2-5

(sensitive to demand profile & degree of market concentration)

Issues with increasing the Market Price Cap

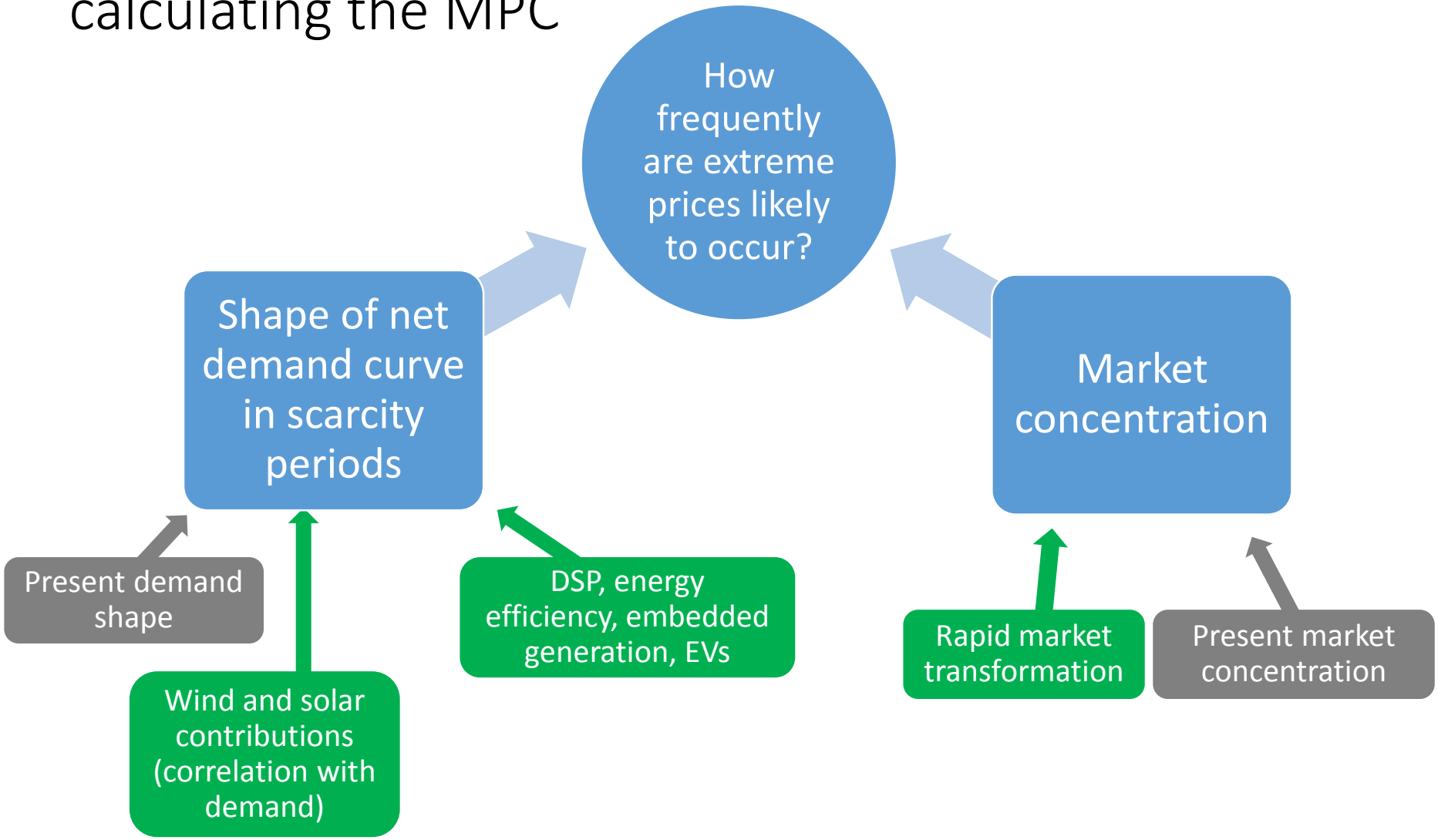
- Increased costs of hedging
- Increased prudential obligations
  - Increased barriers to entry
- Discouragement of inter-regional contracting
  - May interfere with generation locational decisions

Increasing importance of the contracts market

Consider:

- Close monitoring
- Mechanisms for increased transparency
- Disincentivise vertical integration
  - Reduces liquidity and contracting options

Increased challenges in calculating the MPC



Demand Side Participation

Why have a Market Price Cap?

- Demand is inelastic
- Need to protect consumers

Increase DSP sufficiently → True representation of "value of lost load" in market, for each consumer → No MPC required

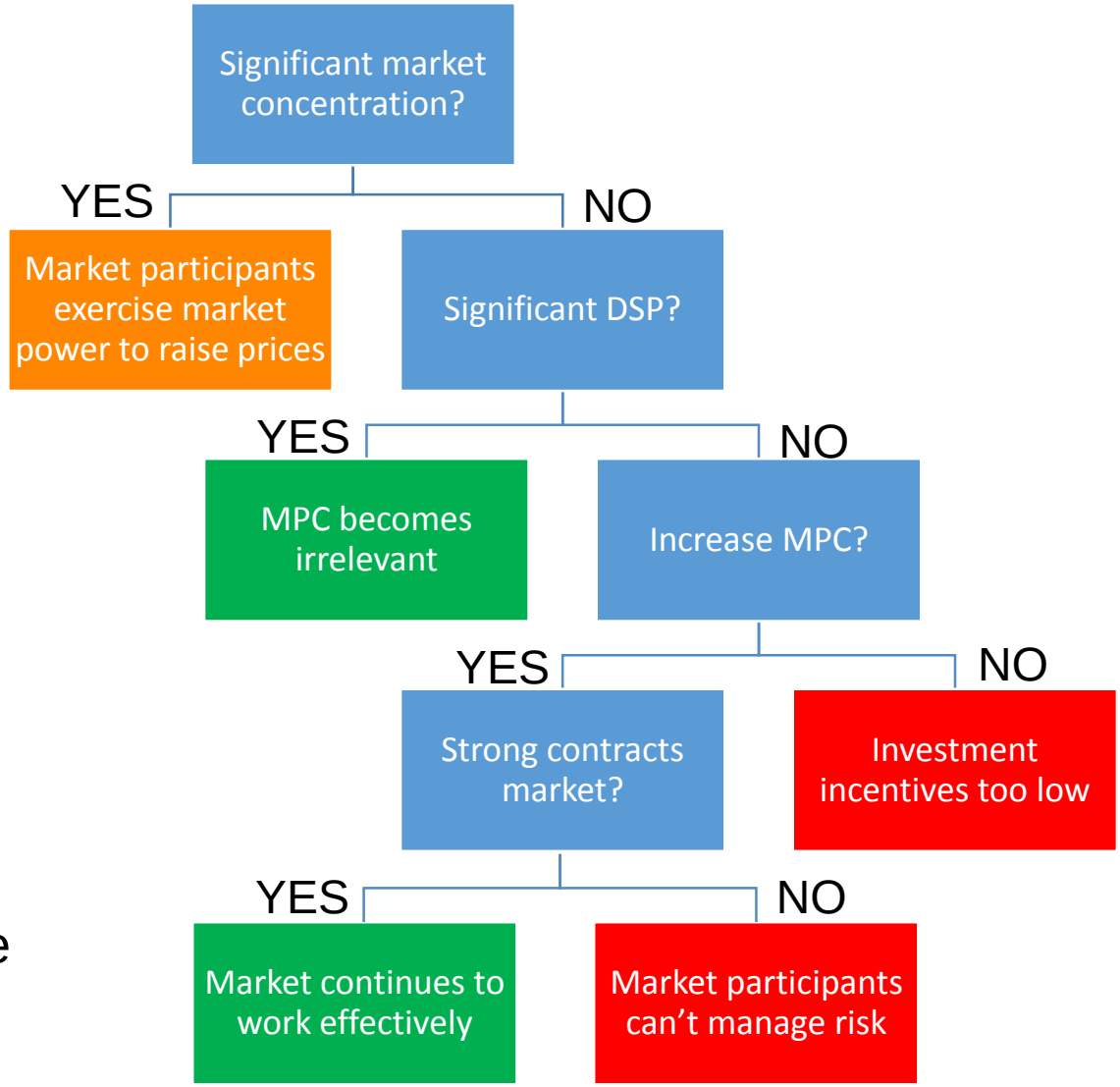
Conclusions

More renewables

Prices close to zero in majority of periods

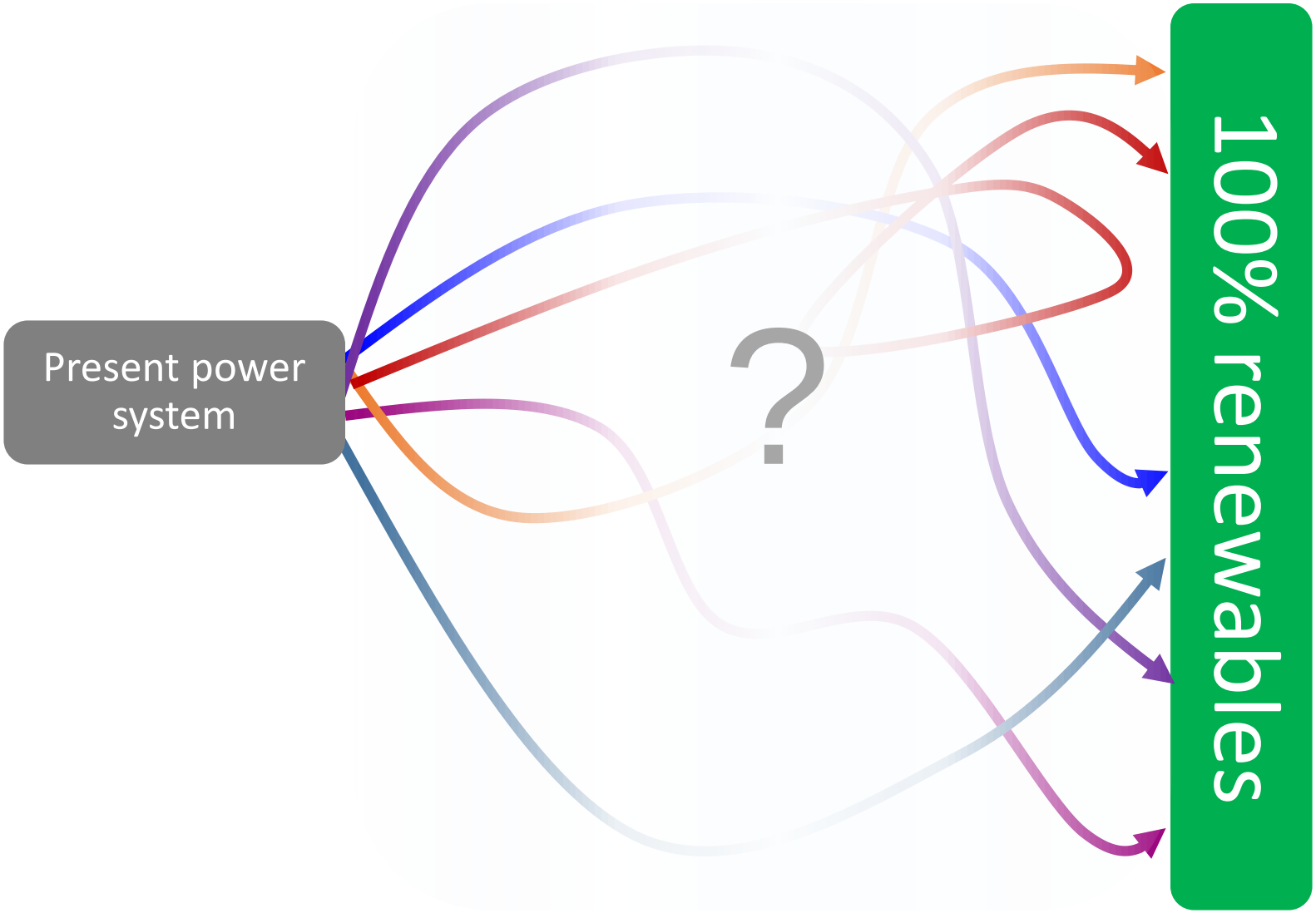
- Not that different from the present NEM
- Already:
  - High price volatility
  - Market Price Cap » generator SRMC
  - Participants manage risk via contracts or vertical integration

Will the energy-only market work?



Constant monitoring is wise – new issues will arise over time

A journey of discovery




Thank you
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