

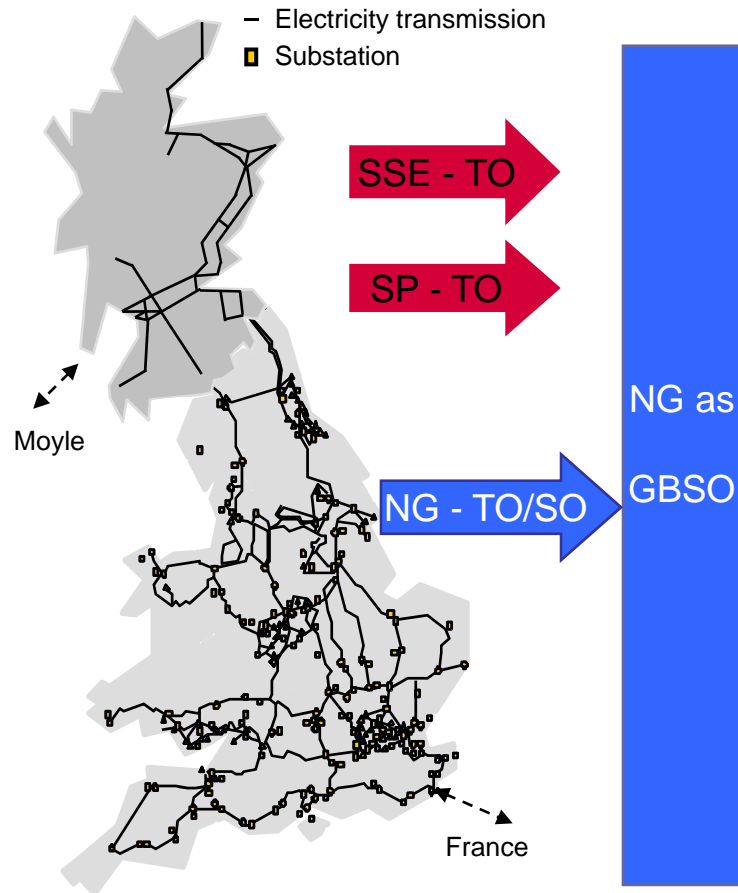
System Operator Review - NGET

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Contents

- ◆ Incentive history
- ◆ Cost drivers
- ◆ Future incentives

Transmission: UK electricity transmission



- ◆ GBSO as of April 2005
- ◆ Manage the security and quality of electricity supply in specific timescales
- ◆ Balance generation and demand economically & efficiently
- ◆ Operation of the Balancing Mechanism after Gate Closure
- ◆ Provision of Information to the market

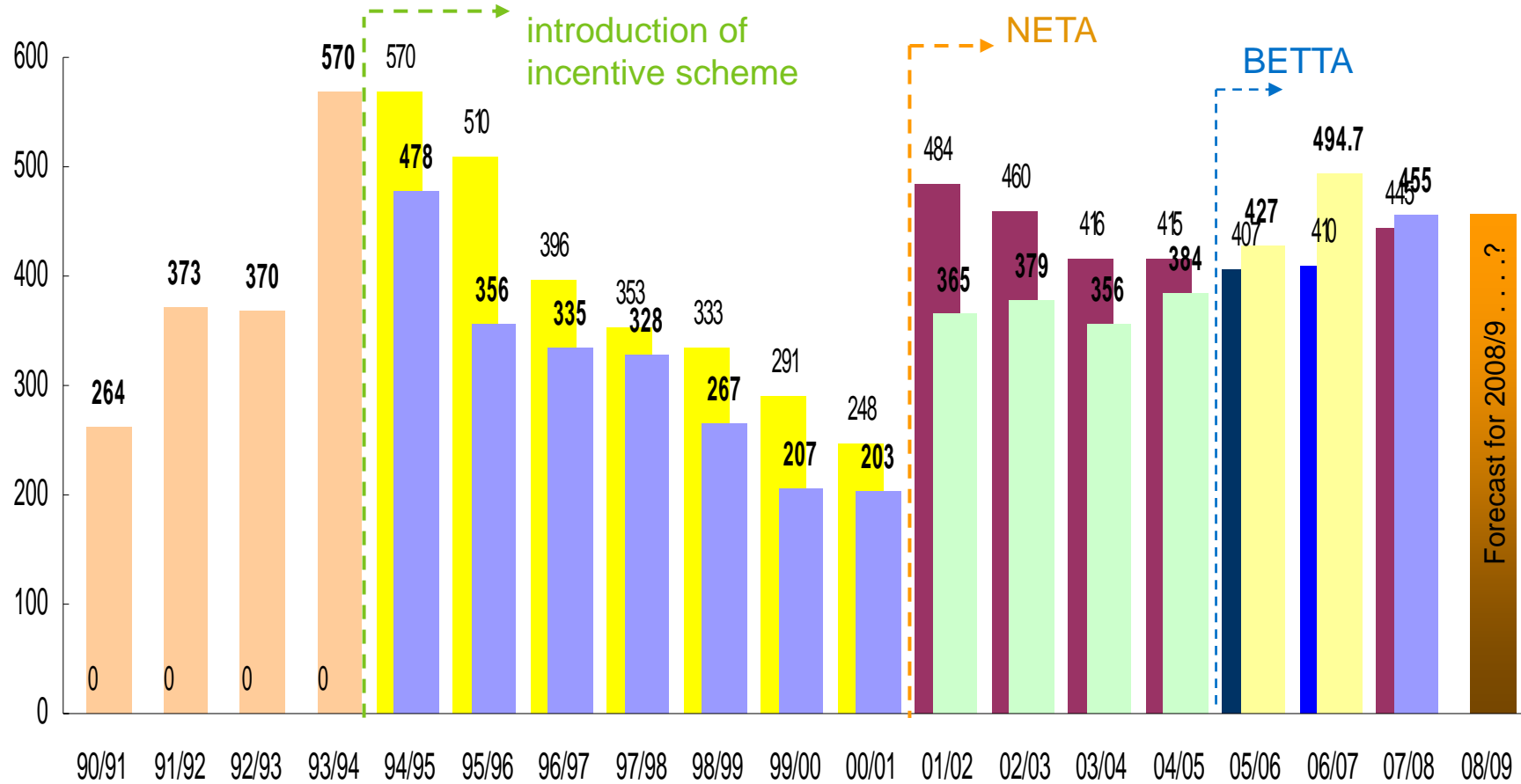
Security & Quality of Supply

- ◆ System security
 - ◆ Securing the network against faults
 - ◆ Voltage management
 - ◆ Resolve Transmission Constraints
- ◆ Balancing
 - ◆ Forecasting Demand
 - ◆ Match generation and demand in real time
 - ◆ Procure 'Reserve' and Frequency Response
 - ◆ Forward trading and BM actions
- ◆ Information provision

Incentive history

- ◆ Incentives developed in 1994 due to increasing operation costs
- ◆ Incentive scheme revised for NETA implementation
- ◆ Incentive aimed at controlling costs and encouraging investment
- ◆ Scheme sets target costs on an annual basis

SO External Incentive Scheme History



Cost Drivers

Key Incentivised Costs

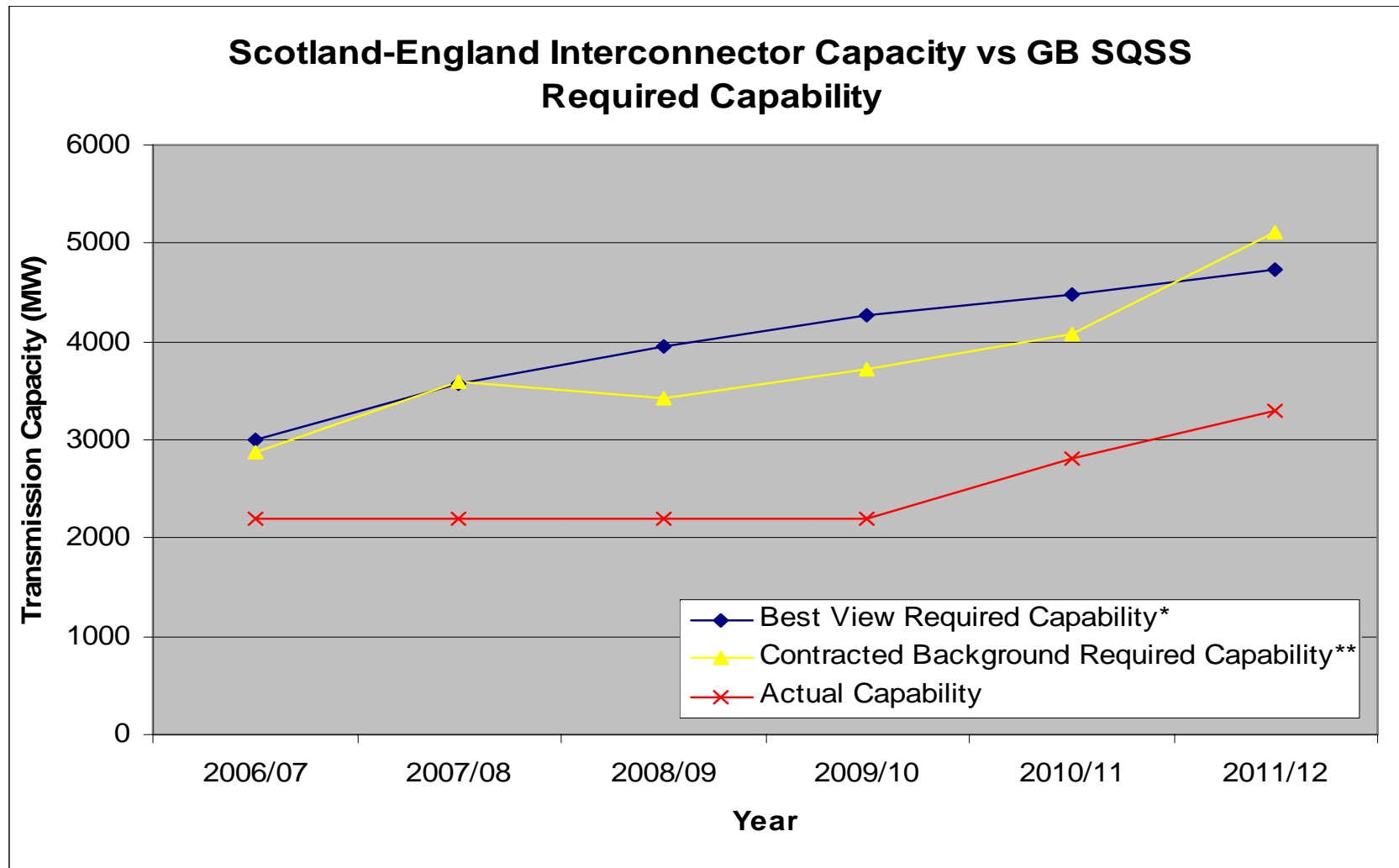
Current main cost areas

- ◆ Constraints
- ◆ Reserve
- ◆ Frequency Response

What will these high costs be in the future . . . ?

- ◆ E.g. constraints
- ◆ Uncertainty with volumes and prices into the future
- ◆ Investing the transmission system to increase capacity across critical boundaries
- ◆ However, volume of new generator connections behind these boundaries are developing at a faster rate

Constraints - Cheviot capability



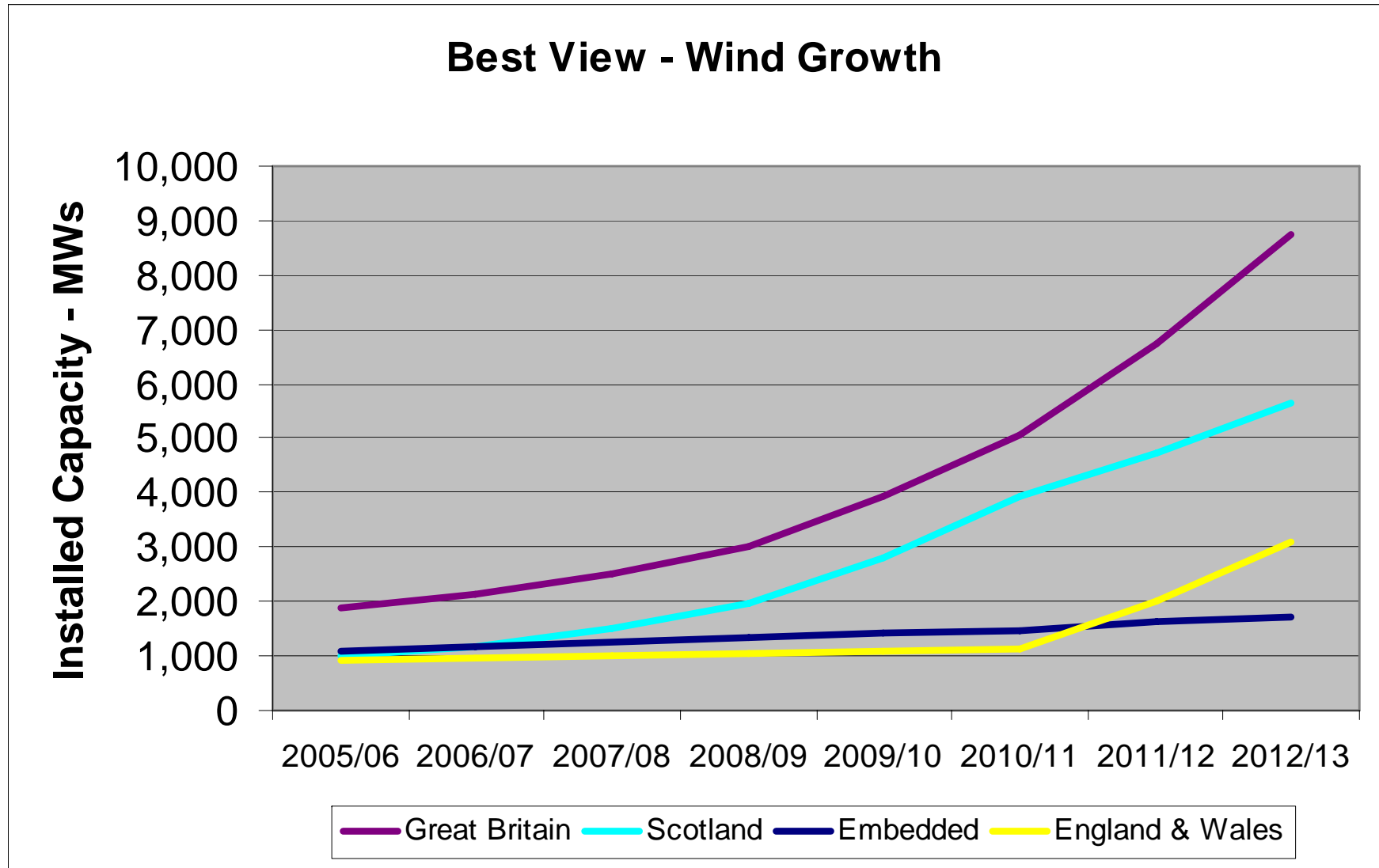
Future Cost Drivers

- ◆ Transmission investment
- ◆ Wind
- ◆ LCPD
- ◆ Interaction with gas market
- ◆ Transmission Access
- ◆ Cash-out review
- ◆ Interaction with European markets
- ◆ Shocks
 - ◆ Market Price
 - ◆ Large generator shut downs (type faults)
- ◆ Framework changes

Future Cost Drivers – e.g. Wind

- ◆ Wind
 - ◆ Interaction with:
 - ◆ Constraints
 - ◆ Dependant on connection location
 - ◆ Reserve
 - ◆ Expected increase in reserve requirements
 - ◆ Response
 - ◆ Potential increase in dynamic requirements
 - ◆ Demand forecast
 - ◆ Embedded wind generation is seen as demand volatility
 - ◆ Policy changes

Future Cost Drivers – e.g. Wind



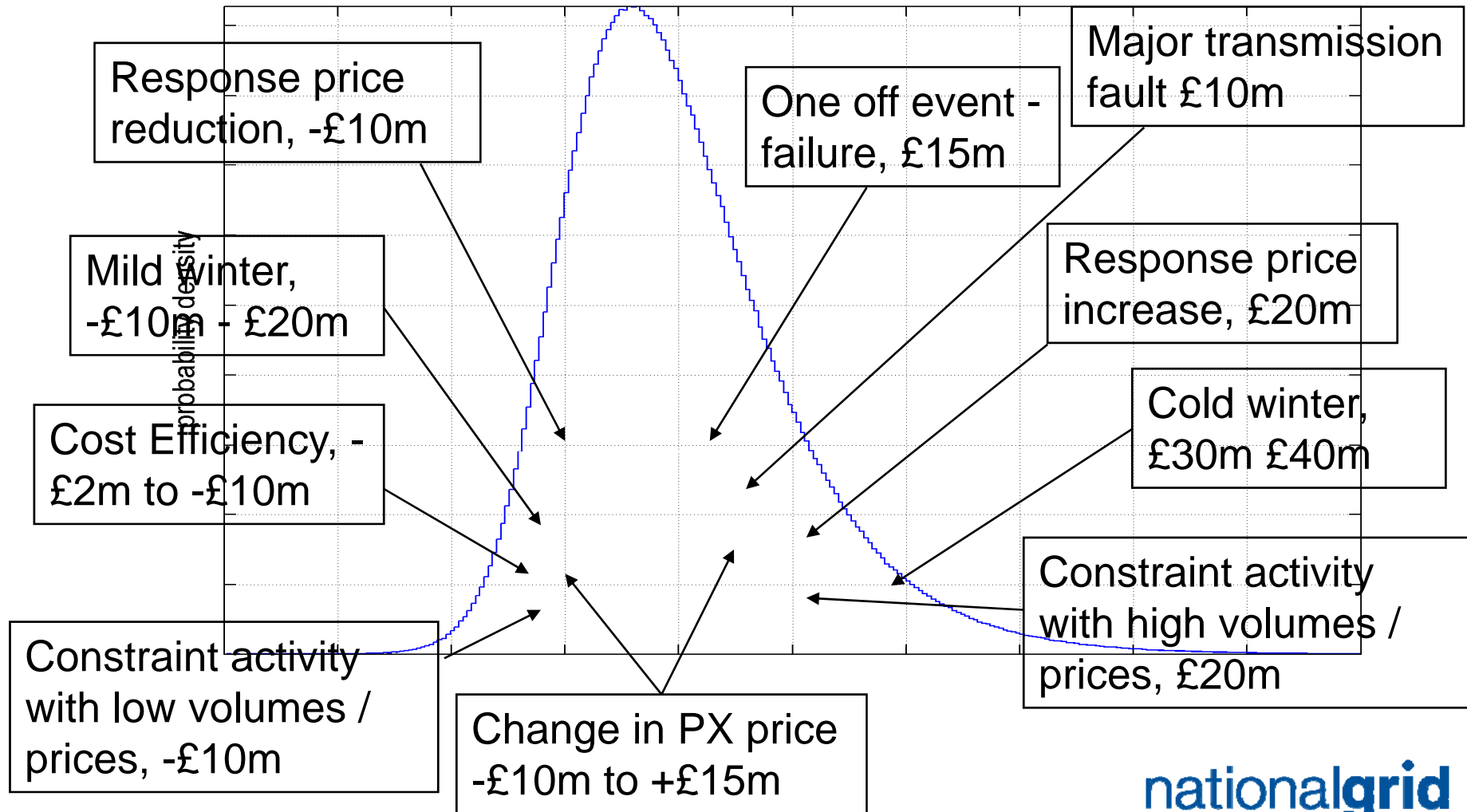
Risk Profile of the SO External Costs

- ◆ Asymmetric risk profile
- ◆ Events outside the control of the SO can significantly effect costs
 - ◆ Market Shocks
 - ◆ Power price changes
 - ◆ Weather e.g. cold winter
- ◆ Incentive arrangements need to work in an environment of increased uncontrollable risks
 - ◆ Recognised in target
 - ◆ Income adjusting events - IAEs
 - ◆ Rarely used and have historically been notified as risks
 - ◆ Target adjusters

Risk mitigation - target adjuster

- ◆ Wind target adjuster
 - ◆ As the scale of wind growth remains uncertain, could develop driver that links wind to target costs
- ◆ Also consider
 - ◆ Power price
 - ◆ Transmission reinforcement
 - ◆ Other

Cost Risk Profile



Risk Profile and Target Setting

- ◆ Forecast cost range and shape of the distribution of costs is as important as the mean forecast value
- ◆ Distribution of costs is key to the development of a full set of incentive scheme parameters:
 - ◆ Target
 - ◆ Deadband
 - ◆ Sharing factors
 - ◆ Caps/collars
 - ◆ Target adjusters

Future Incentive Arrangements that Meet Industry and Consumer Priorities

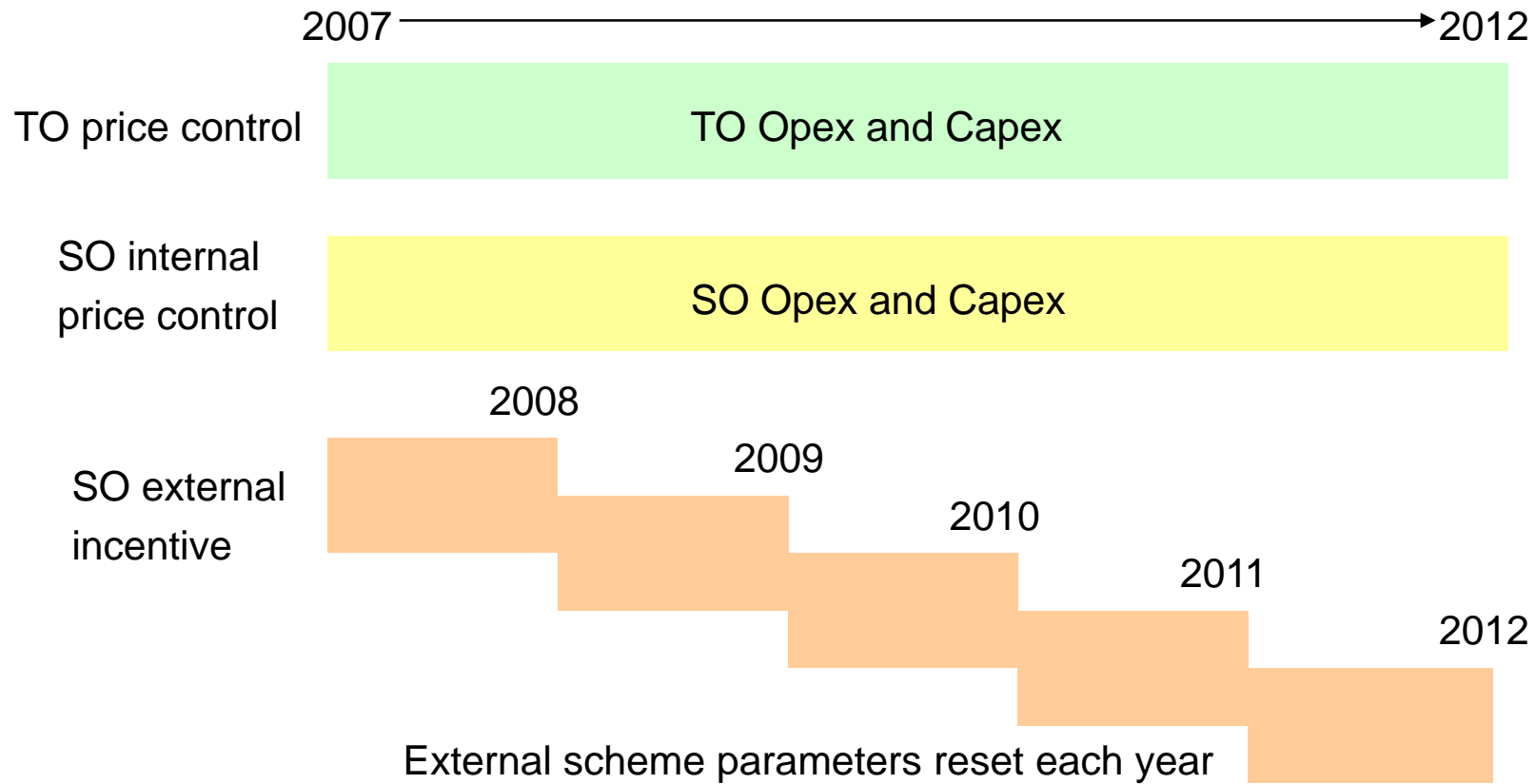
Industry Priorities

- ◆ What are the major industry/consumer concerns?
 - ◆ Lowest possible efficient BSUoS costs?
 - ◆ Lowest overall efficient industry costs of balancing, BSUoS, Imbalance charges etc.
 - ◆ Maintain current security / service standards?
 - ◆ Concern with pollution of imbalance prices?
 - ◆ Cash out review
 - ◆ Facilitation of transmission system access?
 - ◆ Improved information provision?
 - ◆ Implementation costs
 - ◆ Other?...

Industry Priorities

- ◆ SO external cost incentives should facilitate achievement of these....
- ◆ Does the current incentive framework meet this?

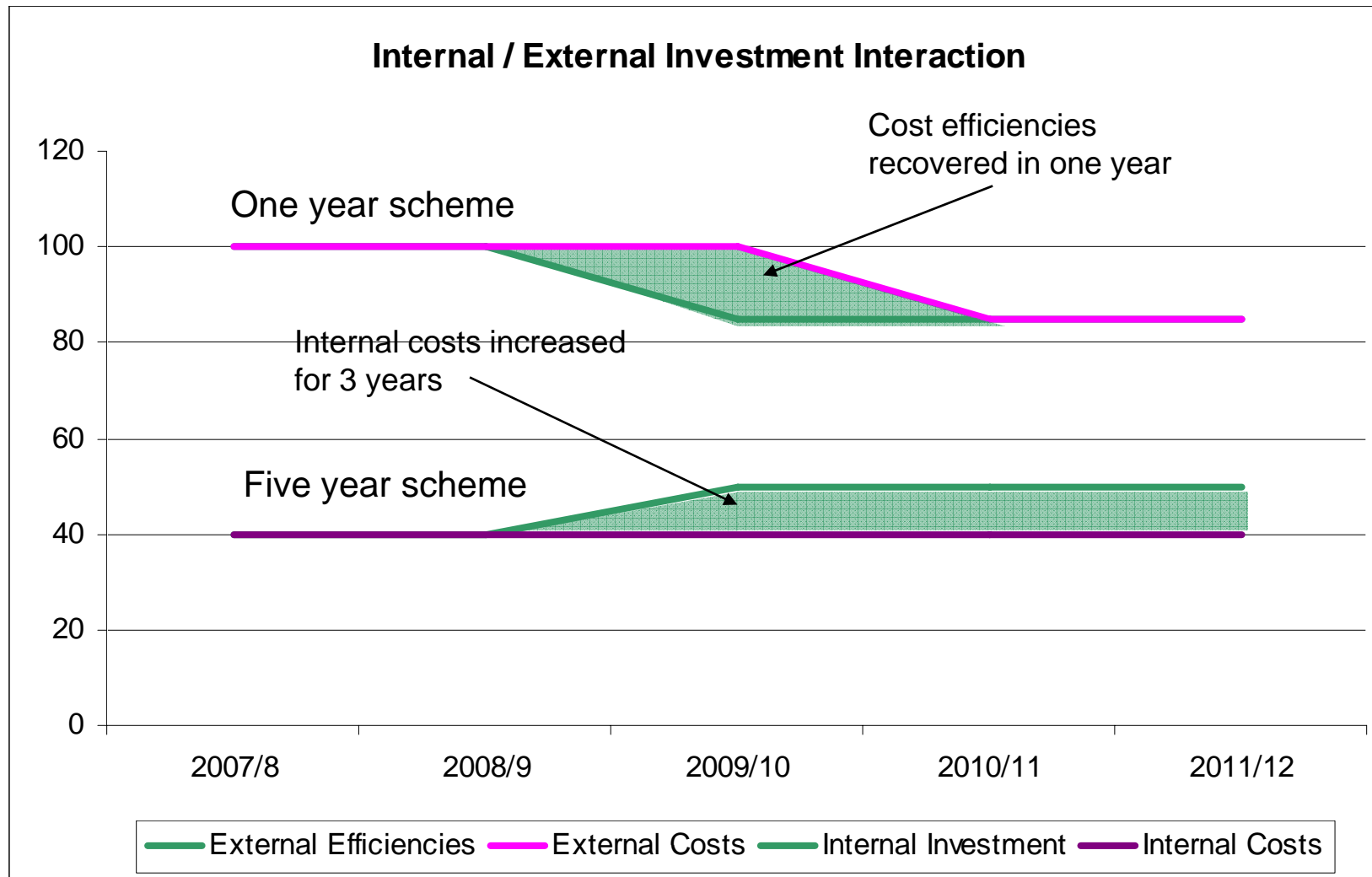
Current Incentive arrangements



Managing external costs

- ◆ The efficiency challenge:
 - ◆ Current costs:
 - ◆ As NETA/BETTA balancing costs mature, bigger investments needed to deliver efficiencies.
 - ◆ Future cost drivers, e.g. Wind:
 - ◆ Gradual cost growth may be mitigated through additional investment
- ◆ Investments in efficiency through:
 - ◆ Staff
 - ◆ Short term e.g. development project – Reserve Review
 - ◆ Permanent increase – frequency response analysis
 - ◆ Systems
 - ◆ Real time optimisation
 - ◆ Development of new analysis tools
 - ◆ Information / data analysis

Internal / External Incentive Trade Offs



Internal / External Incentive trade offs

- ◆ Current framework drives investment / innovation with 1 year payback:
 - ◆ Year on year schemes
 - ◆ Balanced internal and external incentives
- ◆ Greater payback on external performance needed to fund larger investments
 - ◆ As in the previous example, major investment in, for example, frequency response optimisation..
 - ◆ Possible decrease costs by £1m - £5m/annum
 - ◆ Cost in excess of £10m to develop and implement

SO Review

Summary

- ◆ A number of challenges, both in terms of current costs and future cost drivers
- ◆ Can meet these challenges without major change to SO role
- ◆ Support the development of incentive framework that meets the priorities for industry and consumers
 - ◆ Efficient and economic BSUoS/overall market costs of balancing delivered through facilitation of SO investment
 - ◆ Greater investment - support the consideration of longer term incentives – though some challenges to overcome