



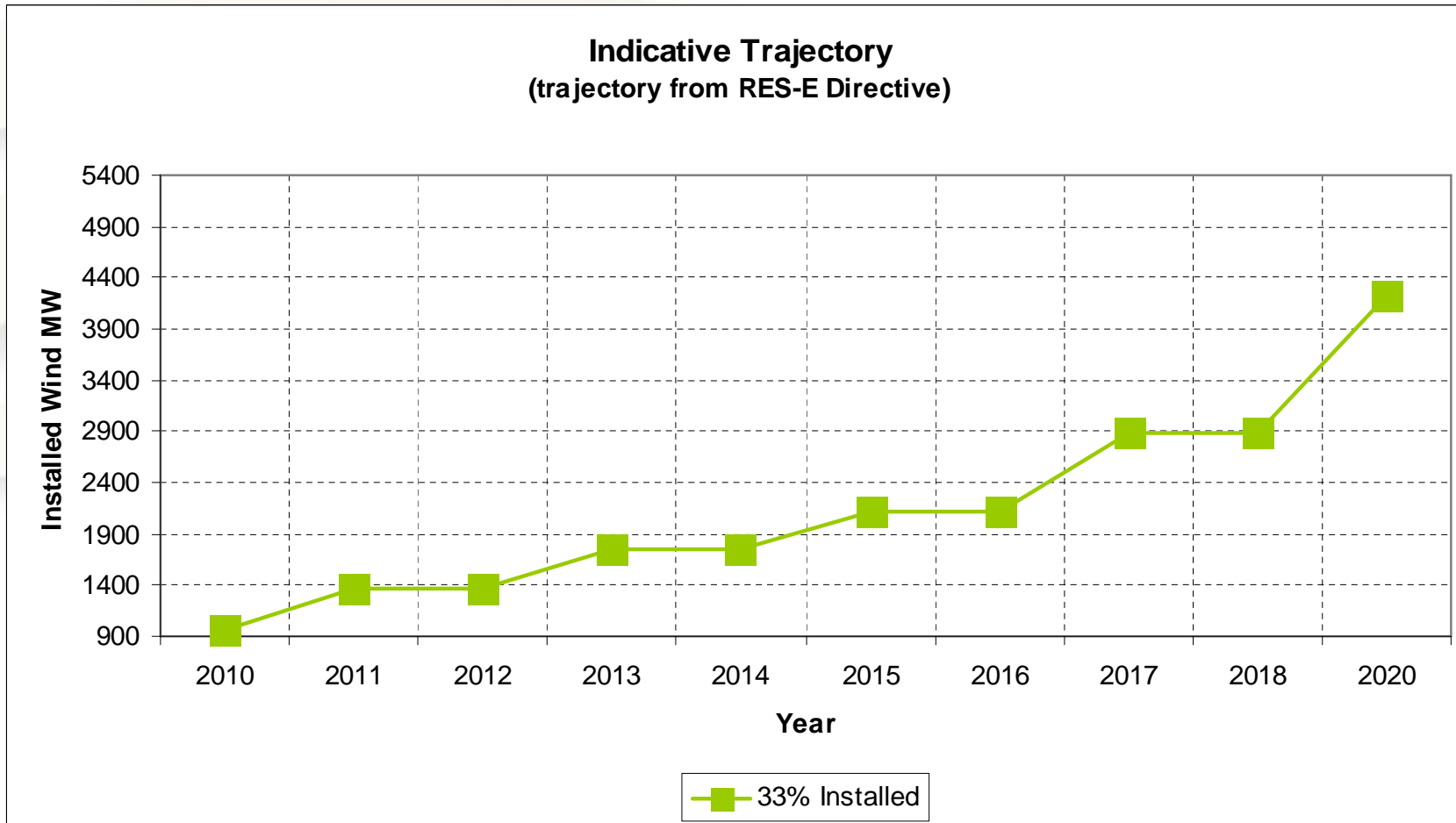
# **Beyond 2020 The Next Frontier**

15<sup>th</sup> October 2008

Jonathan O'Sullivan

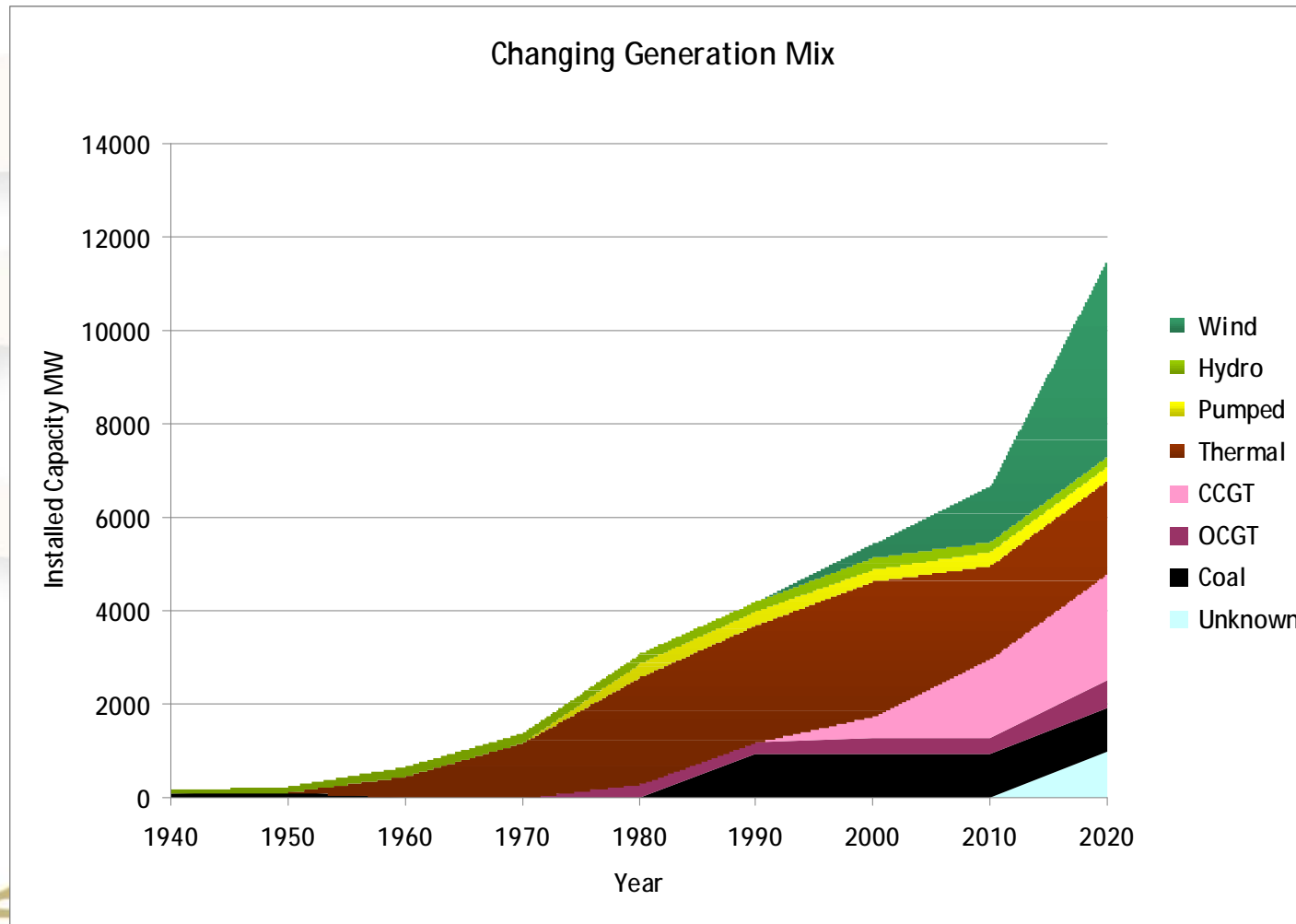


# The Challenge: Government Targets



Source: RES-E Directive using a 30% load factor for wind and a contribution from installed hydro plant

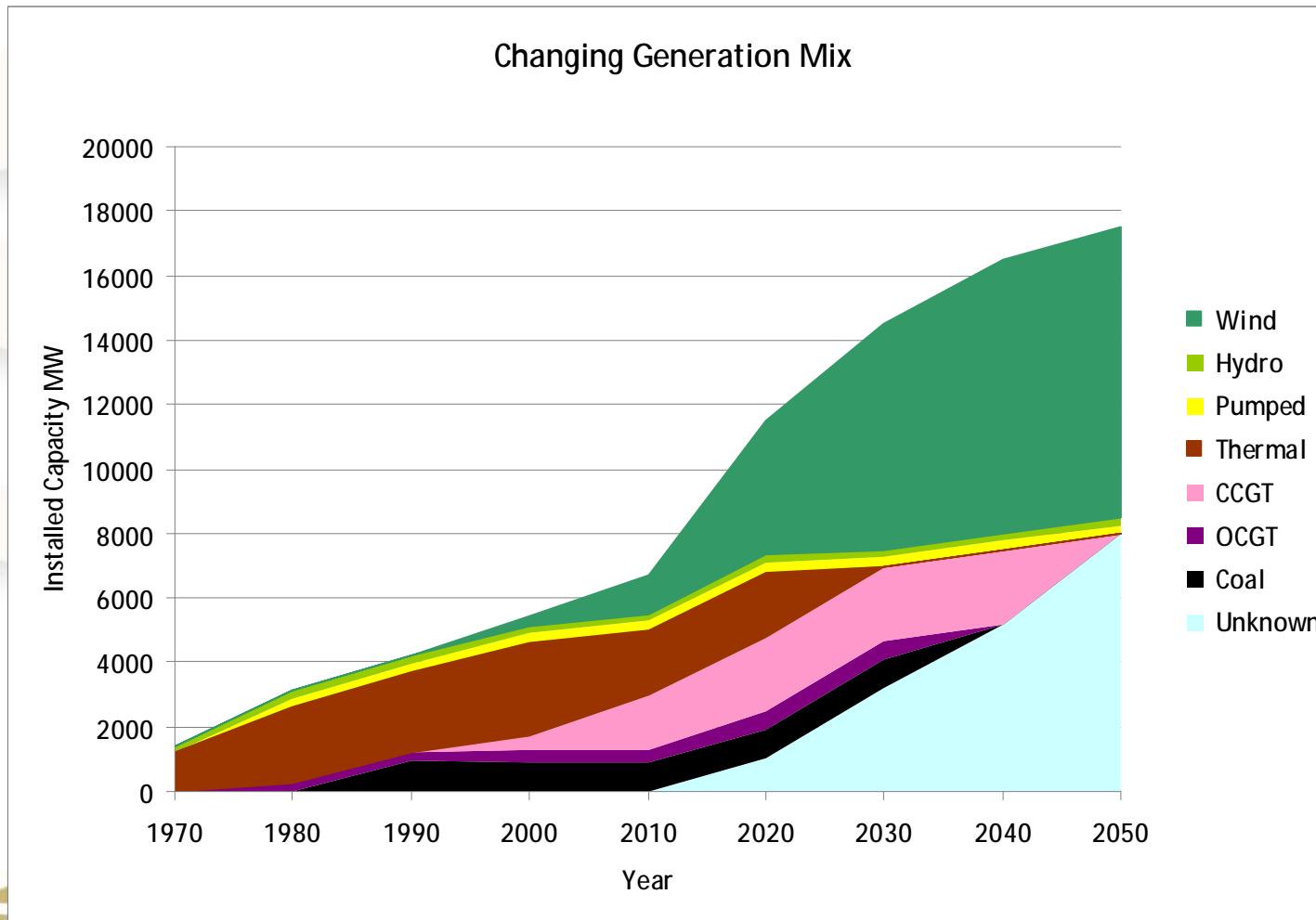
# The Challenge: The Rest of the Portfolio



**EIRGRID**

Source: O'Riordan and the Government white paper with assumptions on load factor and hydro contribution

# The Next Frontier: Beyond 2020



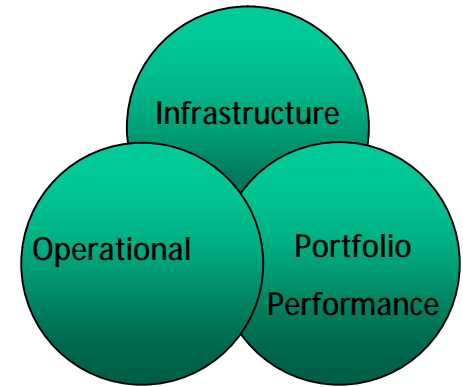
Source: O'Riordan, Government White paper and assumptions on plant life length

# Making it all work by 2020 and beyond

- Infrastructure
  - Issues that have to be overcome, that act as barriers to generators, network customers, operators and owners in identifying potential projects, understanding their possible returns and constructing their assets in a timely and cost efficient manner
- Operational
  - Issues that need to be understood and managed that impact safe, secure and reliable operation of the power system
    - In the short to medium term as transition to system with more renewable power
    - In the long term when significant generation from renewable
- Portfolio Performance
  - Issues that need to be overcome to ensure that the necessary mix of generation and demand flexibility capability is provided and continues to behave and be controllable in line with system requirements



# Issues: Infrastructure



## Issues

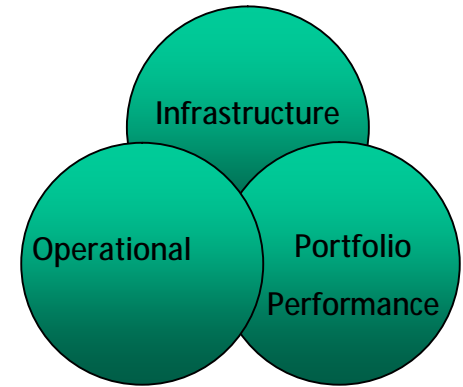
- Issuing connection offers
- Identifying infrastructure requirements
- Building it on time
- Connecting generation

## Actions/Controls

- Implementation of the Gate 3 process and beyond
- Design and implement a mechanism for the strategic development of the power system which has involvement and buy in from all sectors of the industry GRID25
- Planning Permission and necessary consents
- Effective project management backed up by required study and analysis
- Ensuring adequate resources and processes to deliver connections on time



# Issues: Operational



## Issues

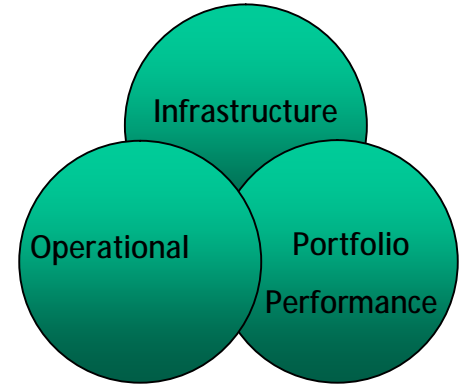
- Increasing Complexity
  - Increased decision making
  - Increased use of infrastructure
  - Exploring new operational territory
- Variability
  - Increasing wind penetration
  - Changing demand profile
  - Changing dynamic characteristics
  - Frequency and voltage control
- Uncertainty
  - Wind production uncertainty
  - Demand uncertainty
    - SMART Metering
    - Transport

## Actions/Controls

- More Tools
  - WSAT
  - Operational Policy
- Develop and Learn
  - Best Practice, Learn from others
  - Training, studies and simulation
- Flexibility
  - All island grid study follow on
- Changing Controls
  - AGC
  - Reactive power strategy
  - Grid study follow on
  - Demand side management (DSM)
- Prediction
  - ANEMOS, SAFEWIND
  - Improved demand prediction
  - SMART Metering



# Issues: Portfolio Performance



## Issues

- Compliance and monitoring
- Supporting standards for a changing power system
- Identifying the properties of a portfolio capable of supporting renewable targets
- Incentivising and supporting the necessary flexibility

## Actions/Controls

- Develop a performance monitoring framework to ensure all users of the Grid are and remain compliant
- Develop the Grid Code to enshrine principles to deal with the changing nature of the power system
- All Island Grid Study Follow On will quantify levels of flexibility required to support target levels of renewable energy
- Develop a holistic policy for the basic financial structures: Energy, Capacity, Ancillary Services and UoS to deliver this necessary portfolio of users



# Key Success Factors to 2020 and beyond

- **Infrastructure**
  - Build the necessary infrastructure, networks and interconnection, for the long term needs
- **Operational**
  - Manage the system with increasing complexity
  - Understand the core drivers for flexibility and variability and develop new operational paradigm to successfully manage
- **Portfolio Performance**
  - Develop and implement a consistent approach across the design (and level) of the market mechanisms to incentivise the correct behaviour and mix of users of the power system



# Questions and Answers

