

# IRP 2010 - Draft Plan

Revision 2

Version 8

8 October 2010

Presentation by the South African Gas Development Company (Pty) Ltd

“iGas”

2 – 3 December 2010

The Bytes Conference Centre, Midrand



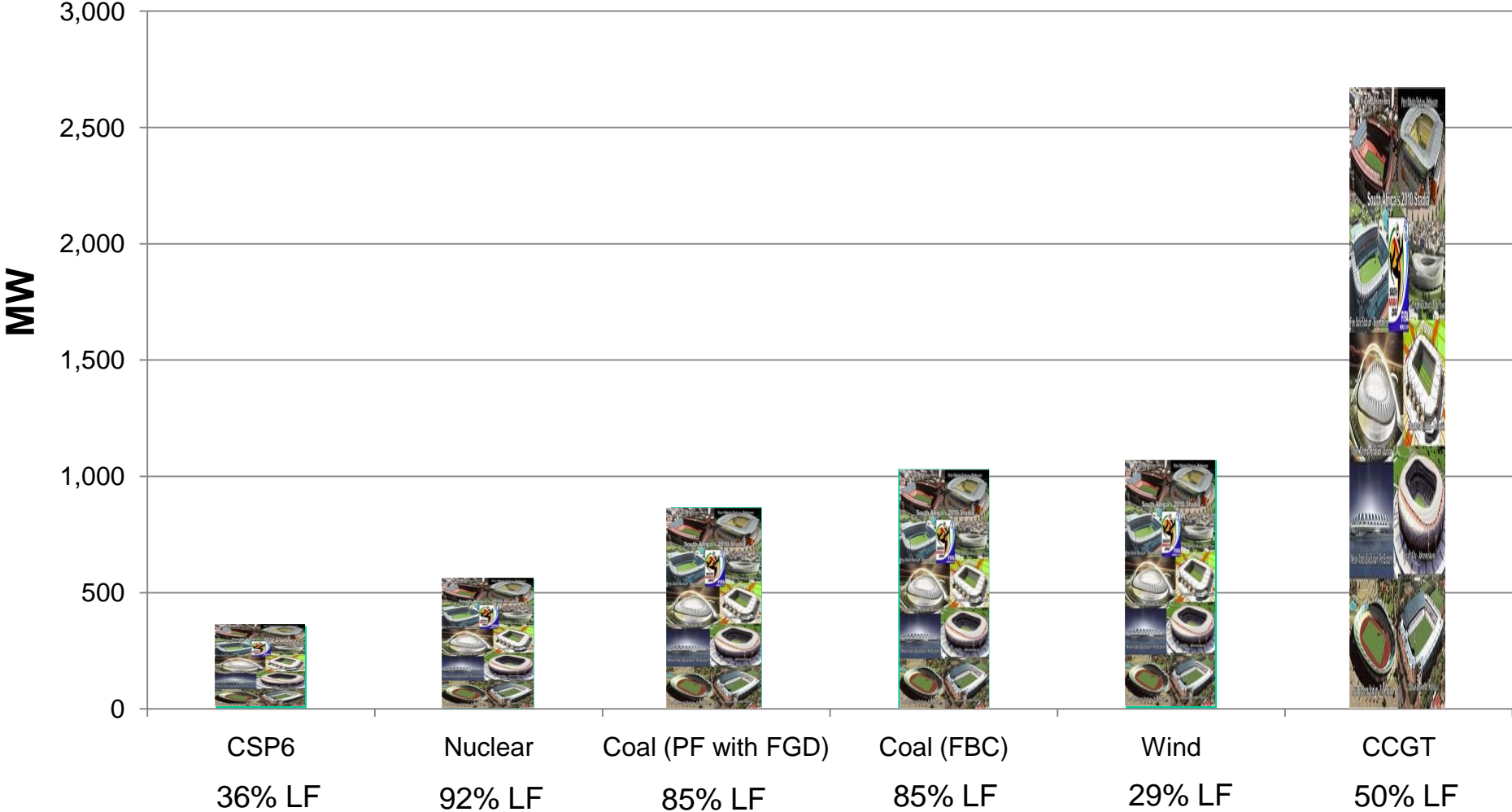
# IRP 2010 Capital Cost in Context

IRP 2010 Scenario	Uncommitted
Base Case 0.0	30
Base Case 0.1	36
Base Case 0.2	30
Emissions 1.0	42
Emissions 1.1	47
Emissions 2.0	42
Emissions 2.1	49
Emissions 3.0	85
Emissions 3.1	87
Carbon Tax 0.0	46
Carbon Tax 0.1	53
Region 0.0	30
Region 0.1	35
DSM 0.0	29
DSM 0.1	35
Balanced	43
Revised	?

times bigger than



# Equivalent MW capacity using Soccer World Cup stadia cost



# Key Concern

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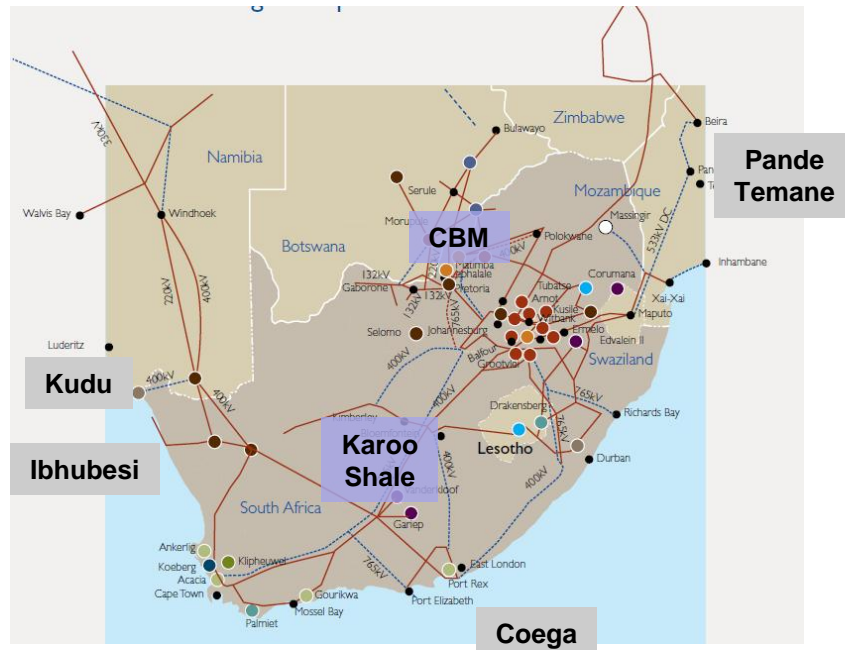
- IRP 2010 not a subset of an Integrated Energy Plan
  - CO<sub>2</sub> emissions requires integrated strategy to ensure optimum mitigation and selection of technologies
    - Growth in automotive emissions can more than offset gains from power generation
    - Technology choices for manufacturing liquid fuels, e.g. CTL
  - Lack of stimulus for development of alternative indigenous energy carriers
    - Indigenous offshore natural gas
    - Indigenous unconventional gas (e.g. shale gas)
    - Indigenous Coal Bed Methane

# Balanced Scenario vs Revised Balanced Scenario

	Balanced Scenario	Risk/Policy Adjustment	Revised Balanced	% Change	Key Risks
Renewables	11 000	400	11 400	4%	Practical Execution System Operations Grid Stability
Nuclear	9 600	0	9 600	-	Funding Schedule
CCGT	4 266	-2 370	1 896	-56%	Schedule Primary Energy Cost
OCGT	4 140	1 610	5 750	39%	Security of Fuel Supply
Coal	4 000	0	4 000	-	Funding CO <sub>2</sub>
Imported Hydro	1 676	1 673	3 349	100%	Schedule
Imported Coal	0	1 000	1 000	-	CO <sub>2</sub>
Co-gen, Own	0	1 253	1 253	-	-
<b>IRP 2010</b>	<b>34 682</b>	<b>3 566</b>	<b>38 248</b>	<b>10%</b>	-

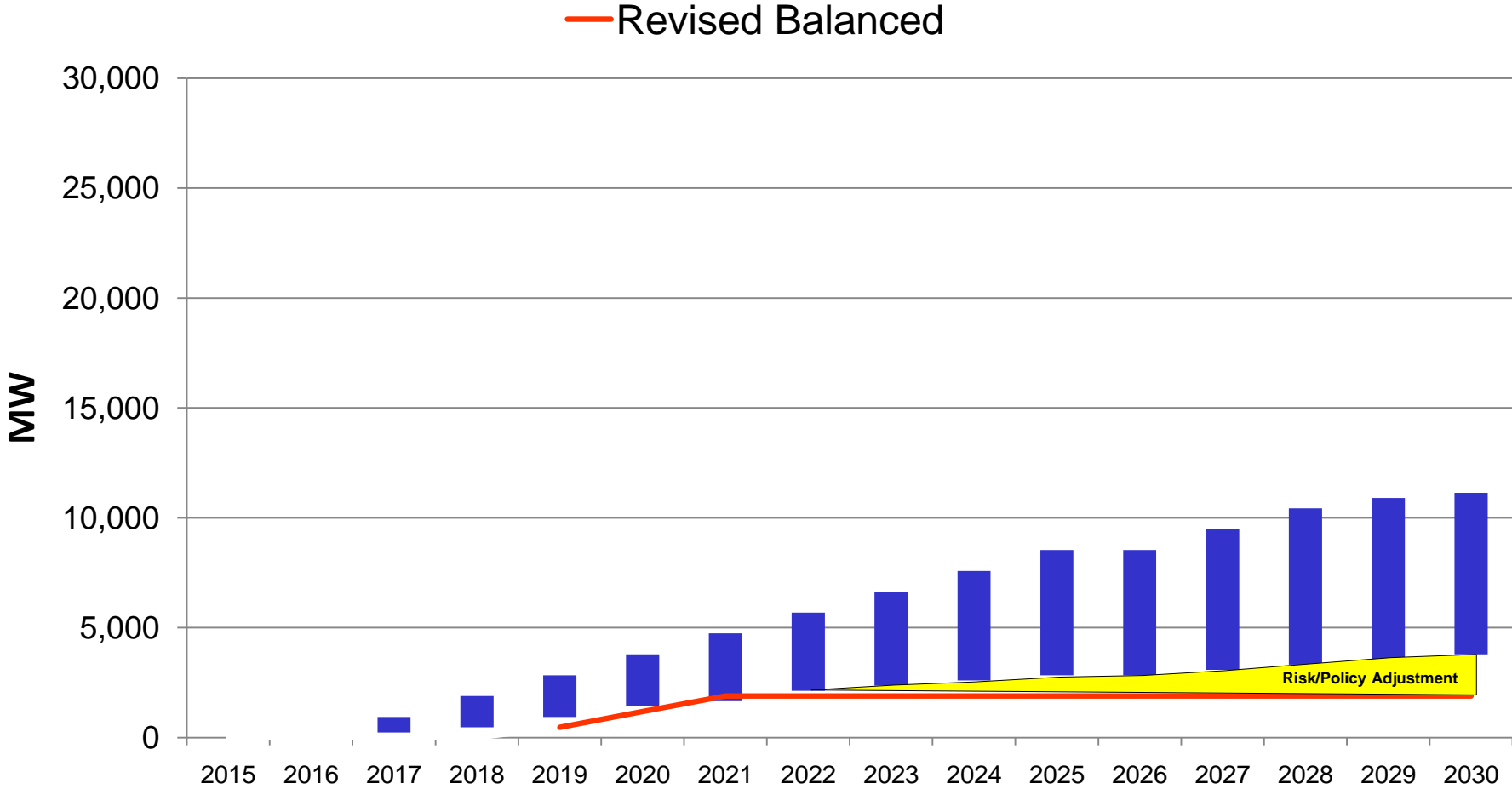
# CCGT dimensions for Natural Gas (50% LF)

	Balanced Scenario	Adjustment	Revised Scenario
Million GJ/a	139 909 109	77 727 283	62 181 826
MMSCF/d gas	483	268	215
TCF gas reserve	3.775	2.097	1.678
Mtpa LNG	2.635	1.464	1.171

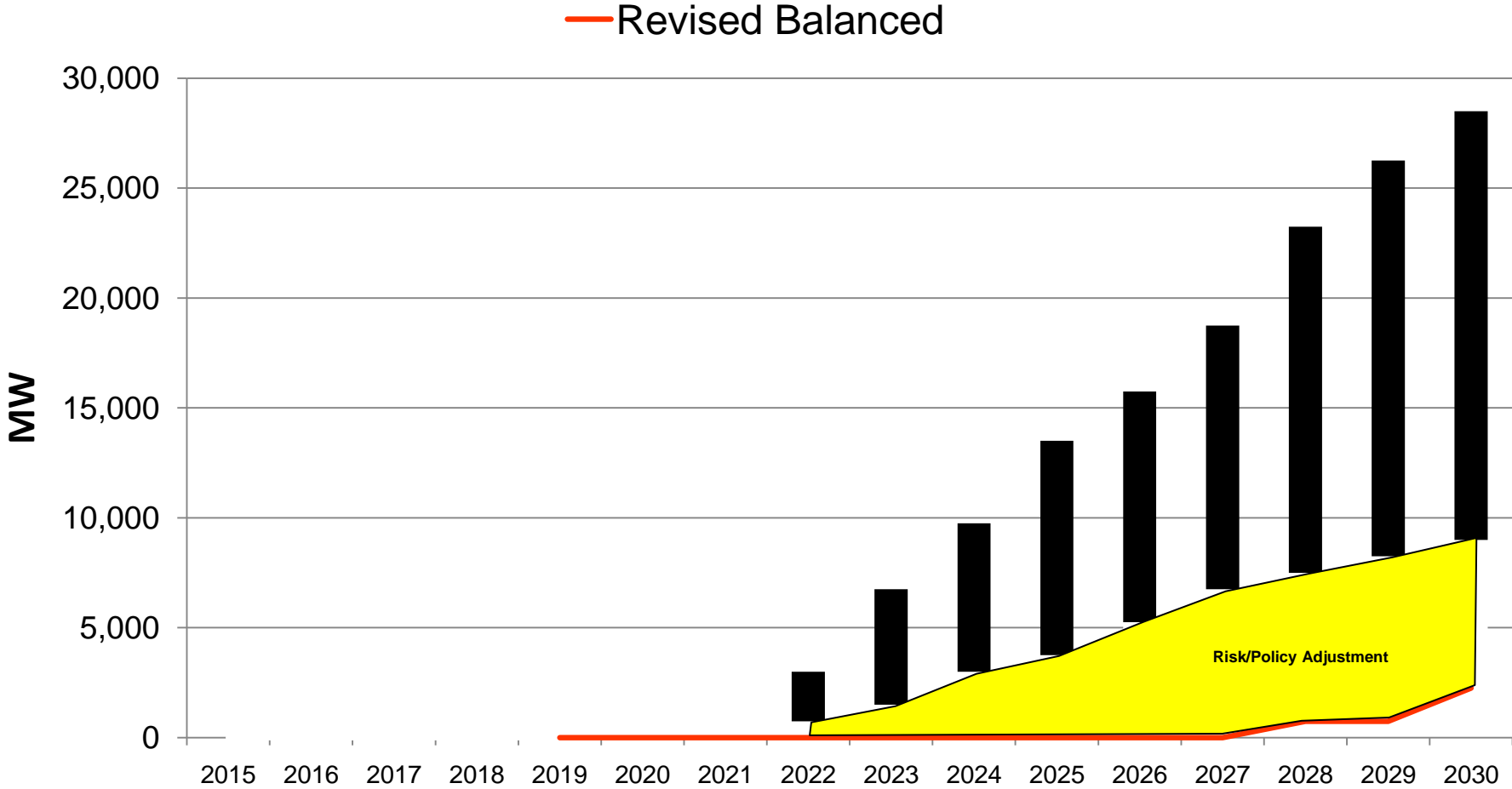


- **Security of Supply is achievable**
  - ❖ Indigenous Gas
  - ❖ Pipeline Imports
  - ❖ LNG Imports
- **Gas/LNG infrastructure on the critical path**

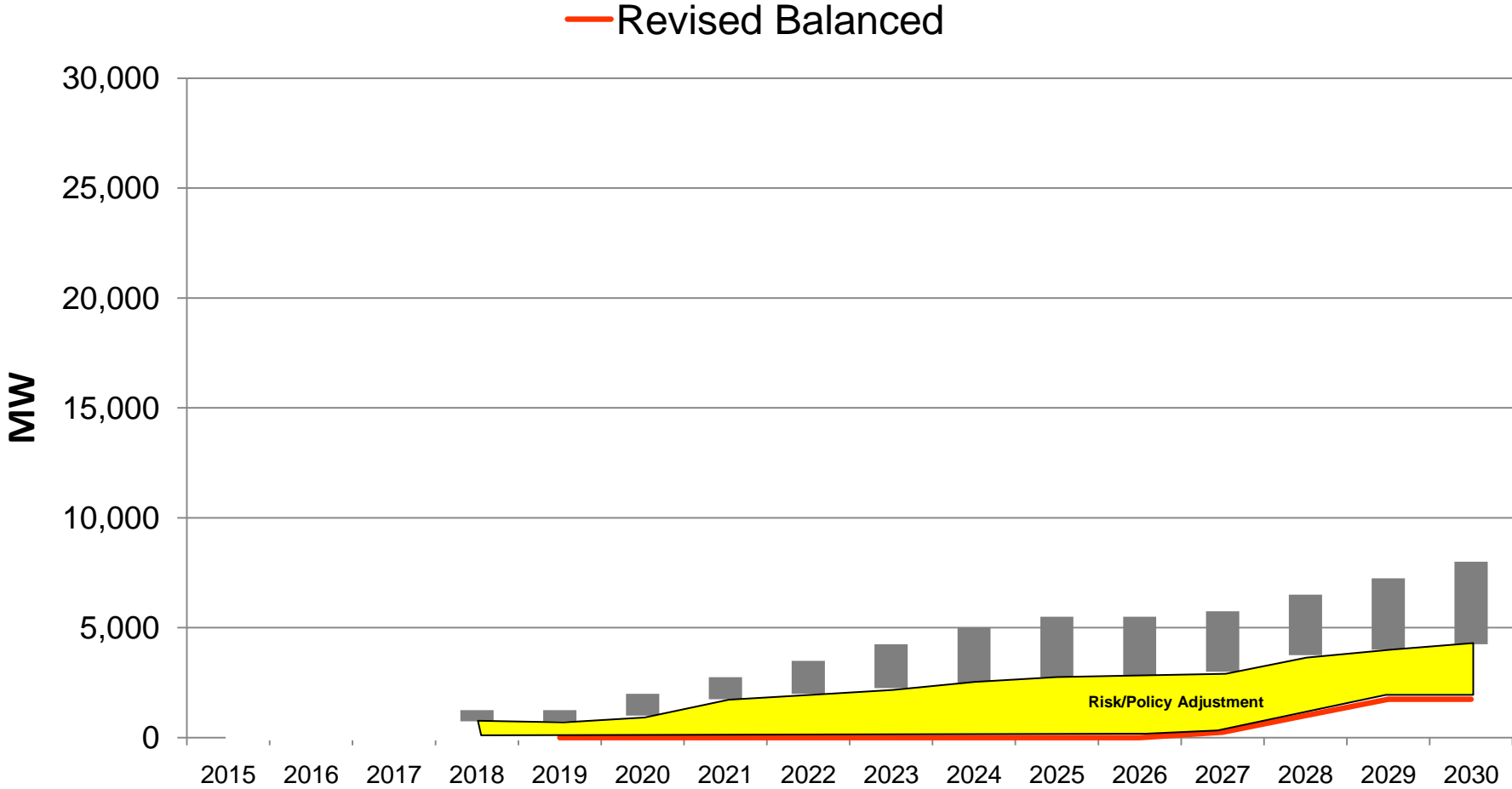
# Range and Timing of MW for All Scenarios – CCGT



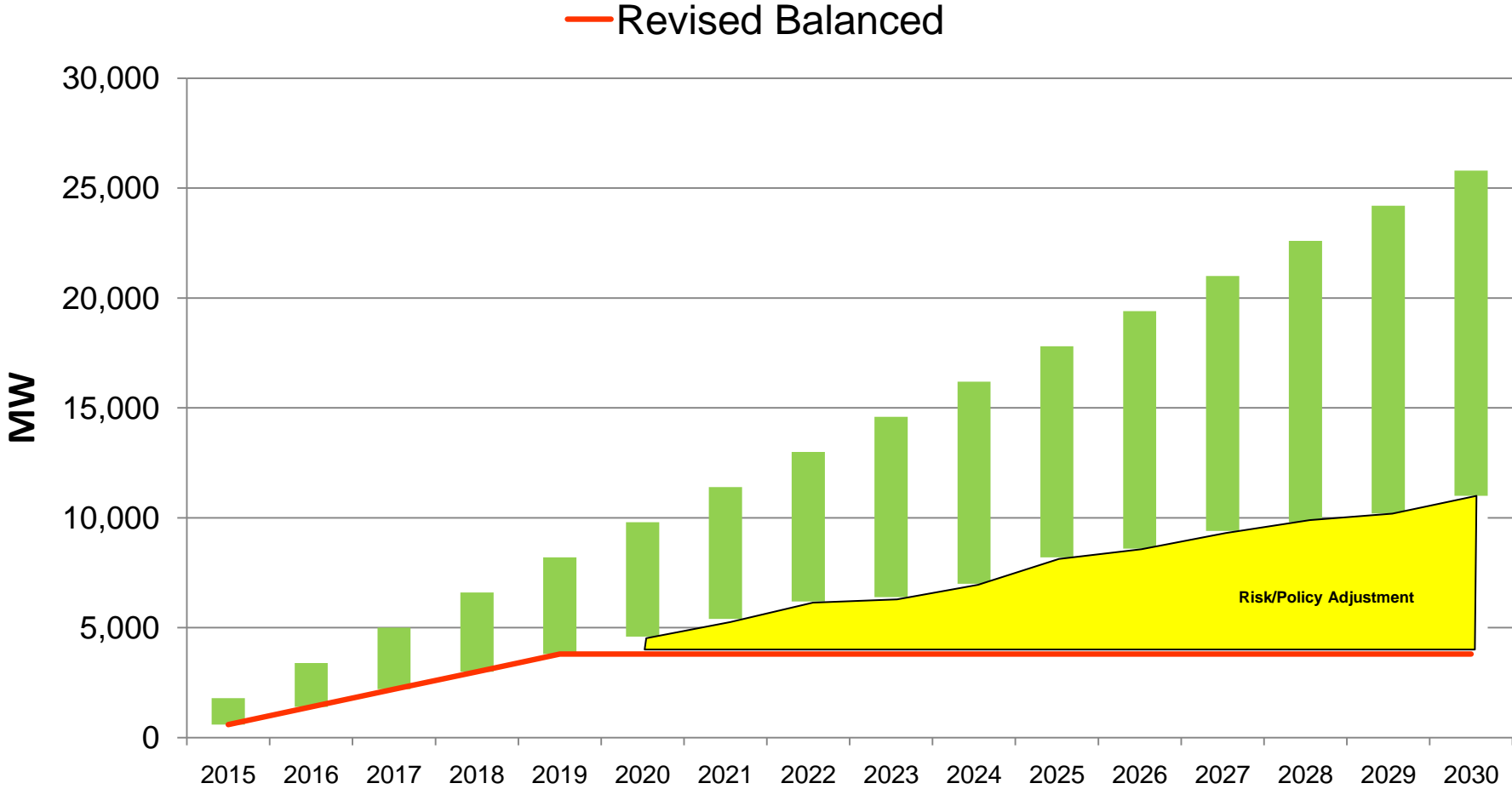
# Range and Timing of MW for All Scenarios – Coal PF + FGD



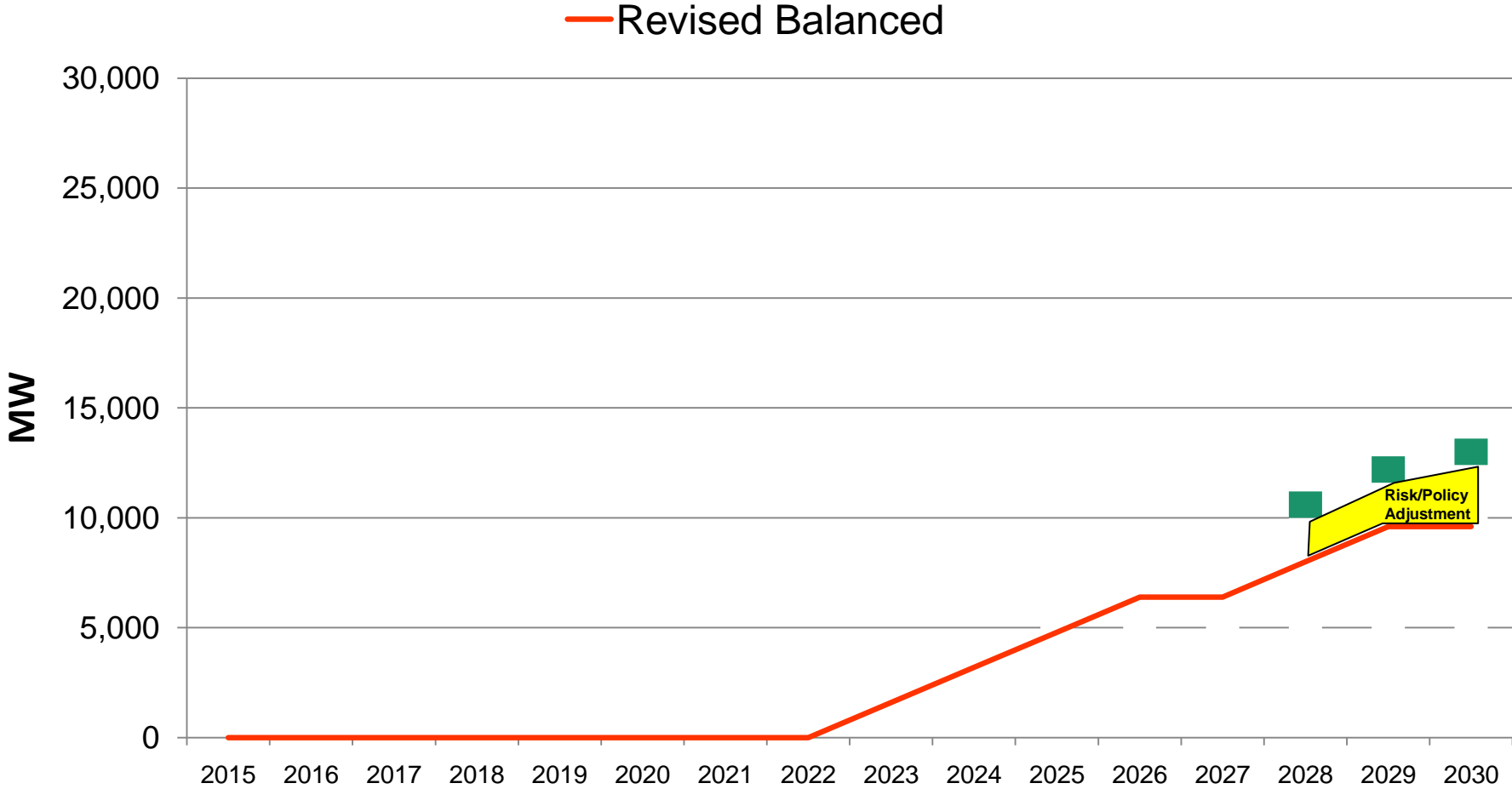
# Range and Timing of MW for All Scenarios – Coal FBC



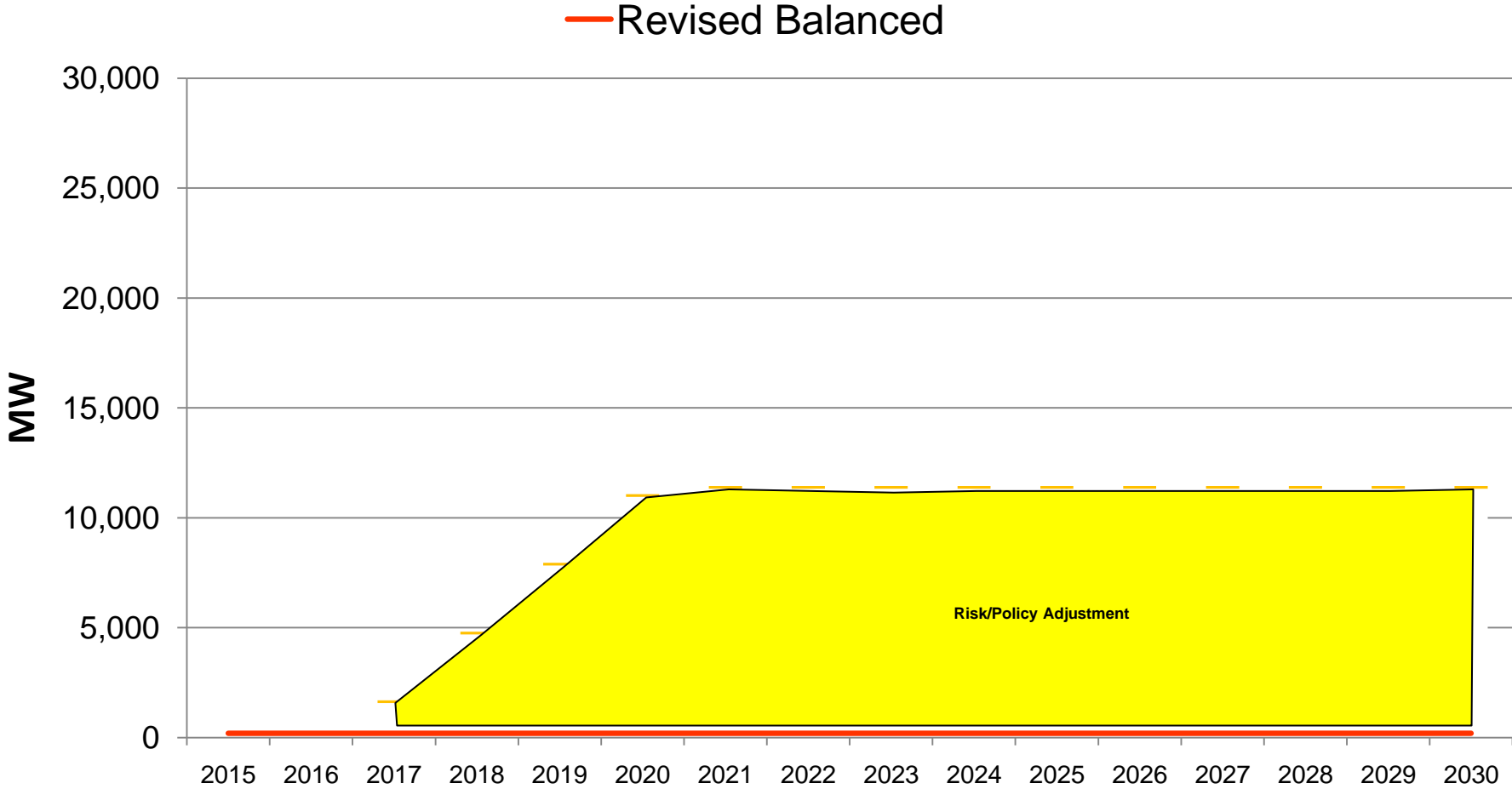
# Range and Timing of MW for All Scenarios – Wind



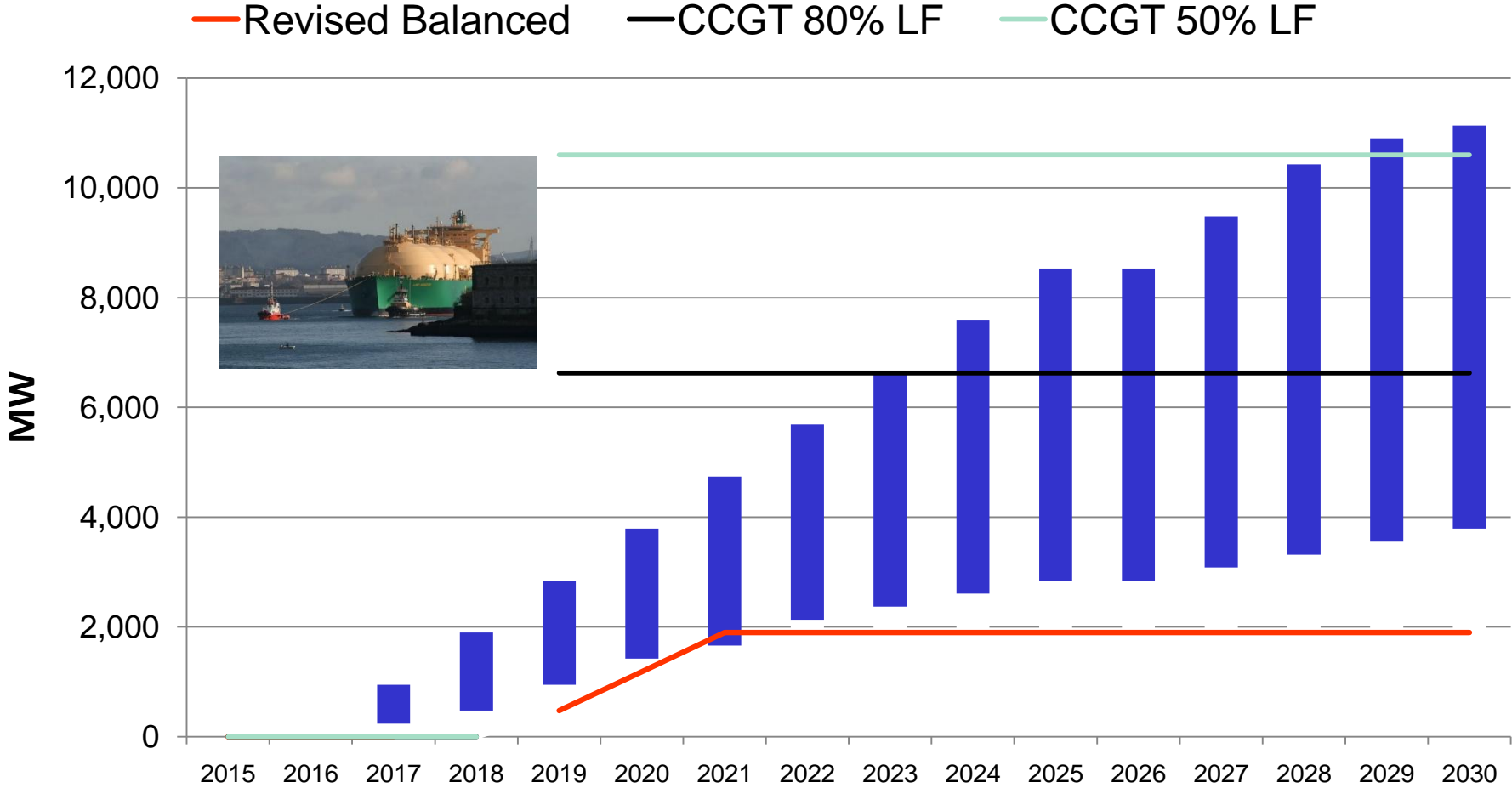
# Range and Timing of MW for All Scenarios – Nuclear



# Range and Timing of MW for All Scenarios – CSP



# IRP 2010 – CCGT Opportunity vs LNG Berth Capacity



# Closing Remarks

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- The contribution to IRP2010 from gas-fired CCGT has been significantly lowered
- Security of gas supply should not be a concern
- Schedule risk is indeed a key challenge (2019) to overcome
- Gas price risks are real, but are effectively managed by 63 out of the 65 major primary energy users globally (only SA and Iceland don't have natural gas in the primary energy mix for power generation)
- Gas-fired CCGT offers funding, CO<sub>2</sub> and security of supply contingency for failure to mitigate:
  - Nuclear funding risk
  - Renewable Energy rollout risk
  - Renewable Energy operational risk
  - Hydro Import schedule risk