

# Cutting the Cost of New Nuclear

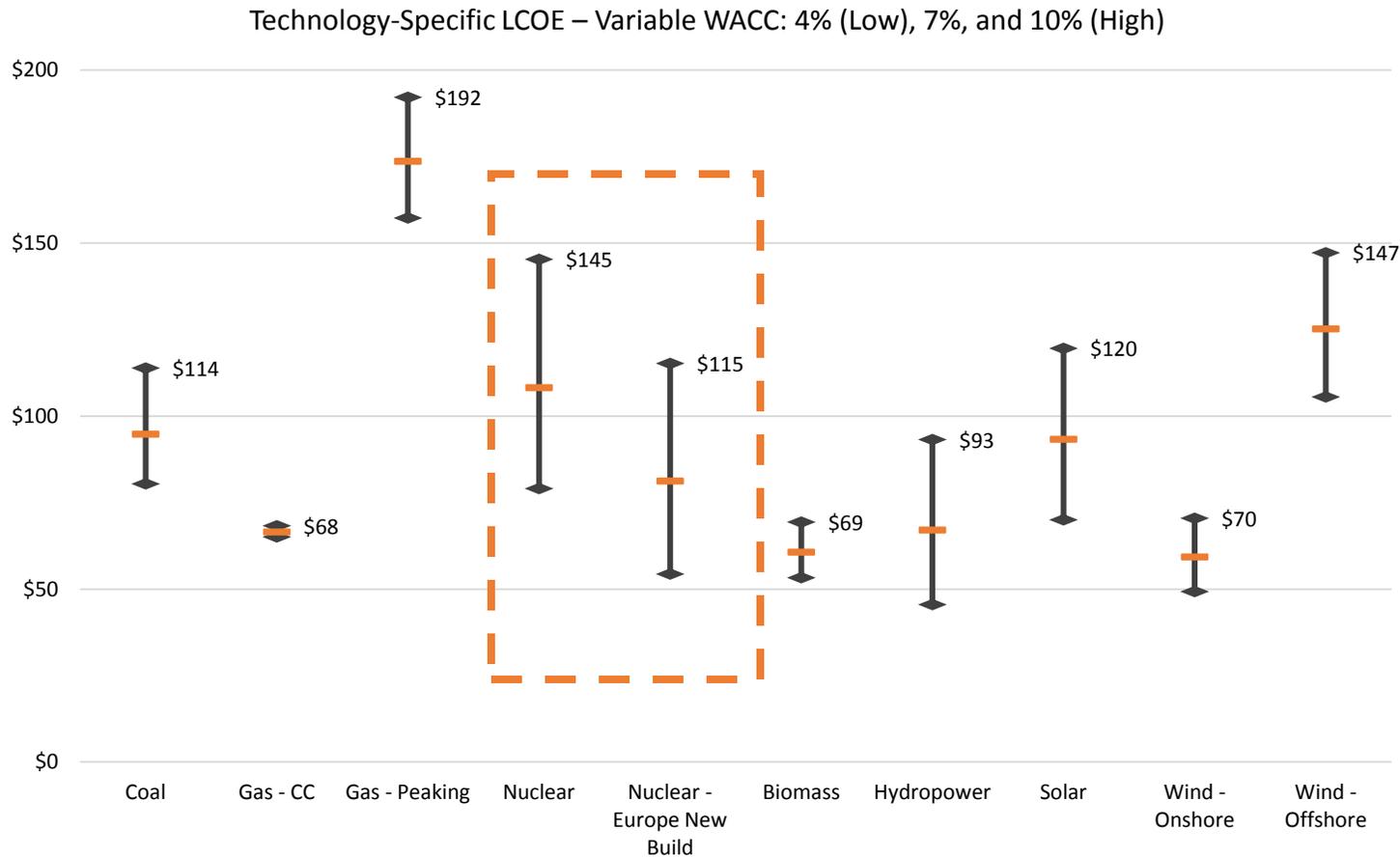
For Consideration

# Table of Contents

1. The Impact of Public/State Involvement on Cost
2. Broader Cost Considerations
3. Construction Cost and Levelised Cost of Electricity
4. Implications for Bulgaria and Southeast Europe

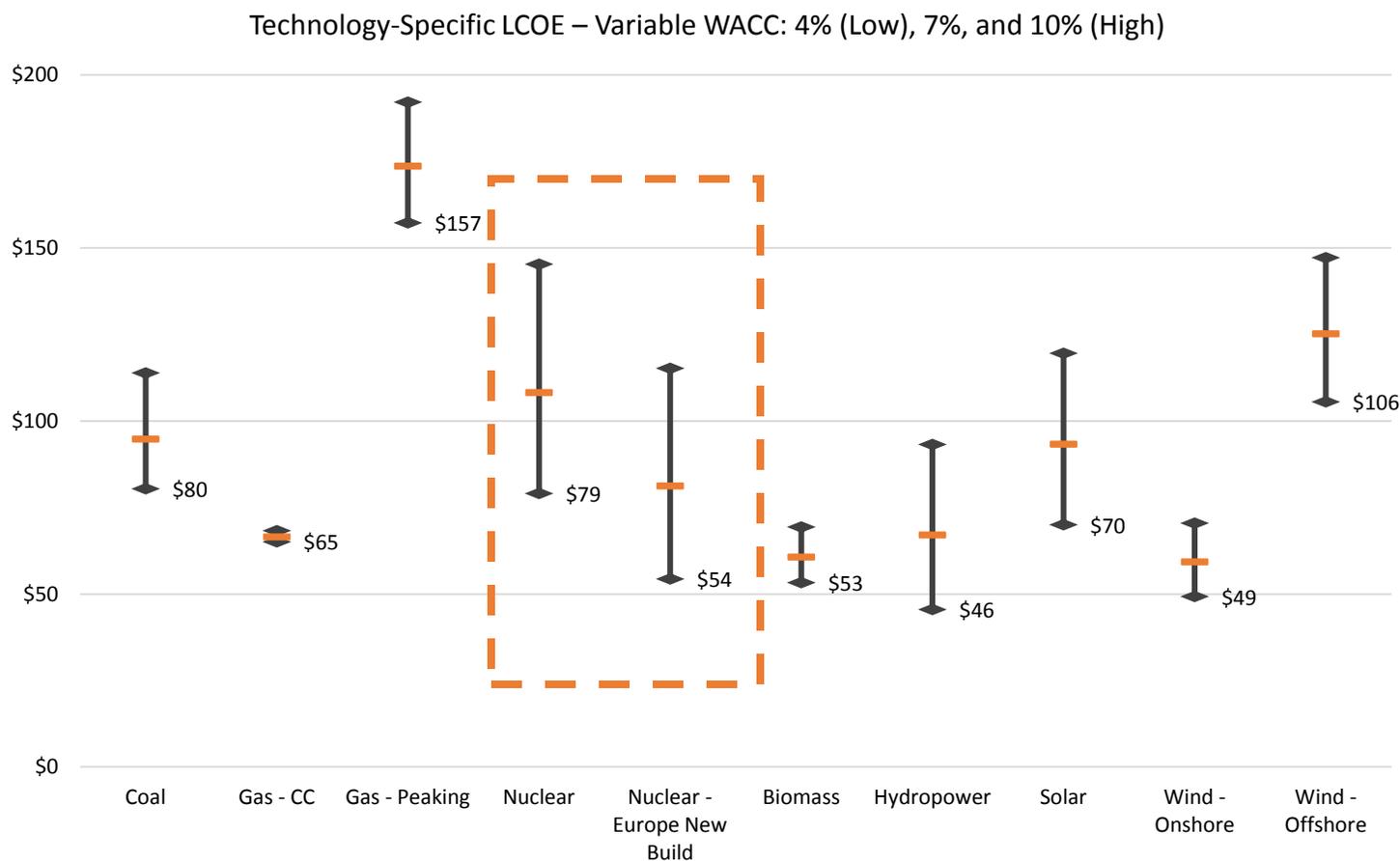
1.

# Private Sector Finance – The ‘Hinkley’ Model



- Private sector actors bear a high cost of capital; power generation technologies are capital-intensive, thus the cost of finance represents a significant proportion of the final electricity price paid by consumers.
- Hinkley Point C: NNB Generation Company – the project company of EDF and CGN – bore the entire construction risk, not recouping its investment until it generates electricity.
- The UK National Audit Office: if the government had taken a 25% equity share in PPP-type deal, the strike price would have been in the range of £69.50-£76.00/MWh

# Public Involvement – The ‘Paks II’ Model



- The principal benefit – from a financial perspective – of a degree of public ownership in energy projects is a reduction in the cost of capital.
- This effect is of particular prominence in the case of nuclear new build, as capital expenditure constitutes a larger proportion of the final levelised cost of electricity than it does in other conventional energy sources.
- Paks II: the upfront capital was provided in its entirety by the Hungarian State, which in turn met 80% of the financing requirements with an interstate loan from the Russian Federation, at an average APR of 4.5%.

# Recent Developments – The ‘Wylfa’ Model

- “The [board] vote to move ahead, at a pivotal meeting on Monday, means the board has accepted the principle of a tripartite investment structure under which Hitachi, the UK government and state-backed Japanese entities would become equal investment partners...”
- But: “the formal agreement to invest in construction of the plant itself is not expected until next year [2019]” and concerns remain over “...capital cost and return on investment.”
- The strike price – the guaranteed sale price – is still under discussion, with the UK government expected to propose £15/MWh less than the Hinkley Point C CfD strike price (i.e. c.£77.50/MWh, in 2012£).

2.

# Characteristics of Low Cost Projects

## Low Cost Plants

NOAK Design

Multiple Units at Single Site

Low Cost and Productive Labour Force

Experienced EPC Consortium and Supply Chain

Detailed Construction Planning (pre-Construction)

**New Build Programme** with Focus on Cost Reduction

Design at/near Completion prior to Construction

“Cost reduction and more predictable delivery can reduce perceived risk and potentially lower the cost of interest during construction (reducing CAPEX even further).”

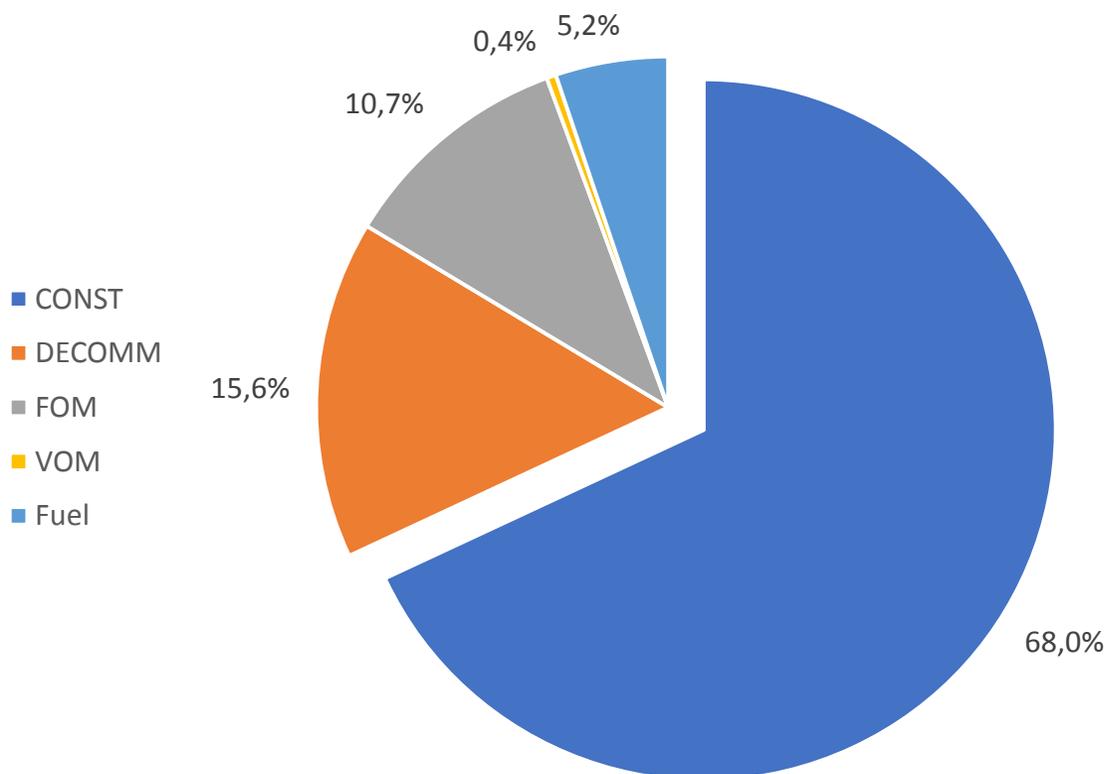


“Successful new build programmes have lowered costs by consciously designing in ways to maximise captured learning and incentivise cost reduction from all parties.”

3.

# Construction Cost Reduction and LCOE

Levelised Cost of Electricity - Decomposition



## Implications:

1. The levelised cost of electricity generated by nuclear plants is heavily decided by construction costs, thus capital cost reductions are integral to their future economic competitiveness.
2. The capital-intensive nature of nuclear plants means that the cost of financing – the discount rate – is the primary determinant of economic viability.

4.

# Implications for Bulgaria and Southeast Europe

- Choosing the deal that delivers:

1. Security of Supply

2. Value for Money for Consumers and Government

3. Sustainability