



# Global Overview of Successful AMI Deployments Lessons on the Benefits of AMI

18 November 2021

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London

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# NERA is a global economic consulting firm with experts specialising in the economics of energy markets, energy policy, and utility regulation

## We work extensively on market design, CBA, and regulation relevant to AMI

- NERA is an economic consulting firm founded in 1961 and which has been intimately involved with the regulation and liberalisation of most major energy markets internationally
- Our Energy Practice consists of over 100 expert economists across the globe
- I am a Director and Co-Head of our Energy Practice in London
- We support utilities, regulators, and investors across the world the economics and regulation of AMI

## The recent assignments below are typical of the kinds of analysis we do on AMI topics



### For Meralco

Study on AMI benefits achieved internationally and advice on CBA methodology



### For a British Retailer

Support on the cost of AMI for a review of a regulatory price cap



### For the Australian Energy Market Commission (AEMC)

Advice on optimal data-sharing requirements to realise benefits of AMI



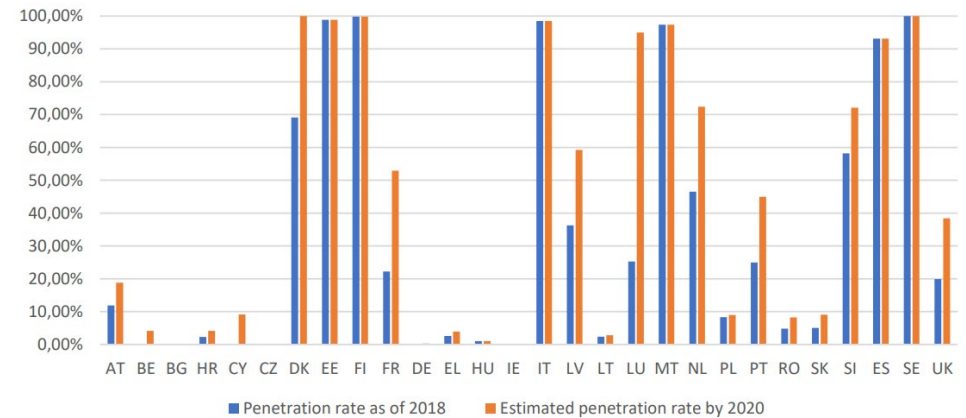
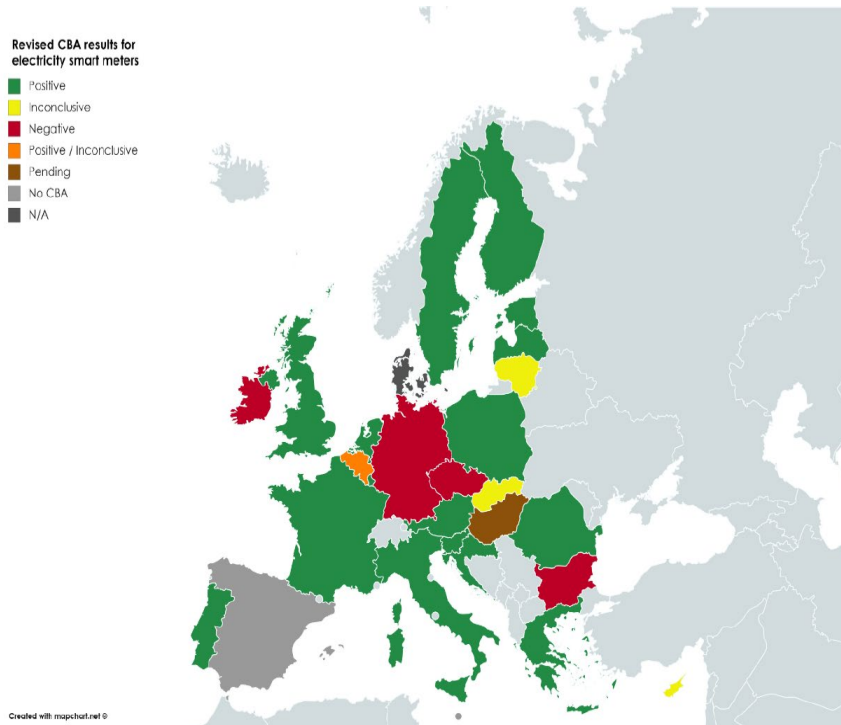
### For a Pan-European Investor

Strategic advice on investment opportunities in AMI

# Positive findings in Cost Benefit Analyses have driven smart meter roll-out programmes across Europe

## European Assessments of the Costs and Benefits of AMI Deployment<sup>1</sup>

## Deployment, however, varies widely between member states<sup>2</sup>

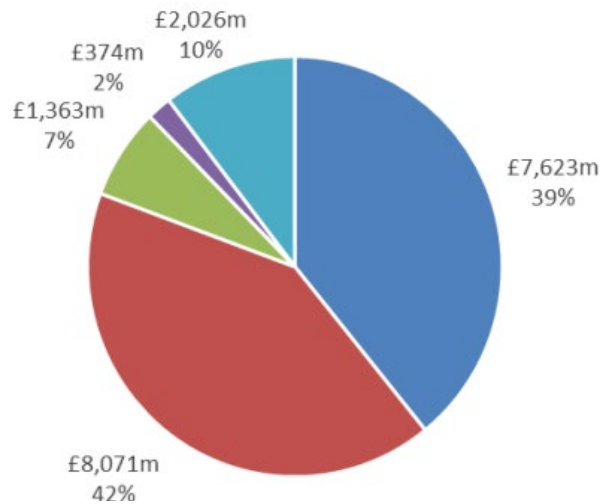


- Estonia (>98% in 2017)
- Finland (100% 2013),
- Italy (95% by 2011),
- Malta ([80-85]% by 2014),
- Spain (100% end of 2018); and
- Sweden (100% by 2009).

1. Source: European Commission (2019): „Benchmarking Smart Metering Deployment in the EU-28“, Fig. 1, p. 18.  
2. Source: European Commission (2019): „Benchmarking Smart Metering Deployment in the EU-28“, Fig. 25, p. 68.

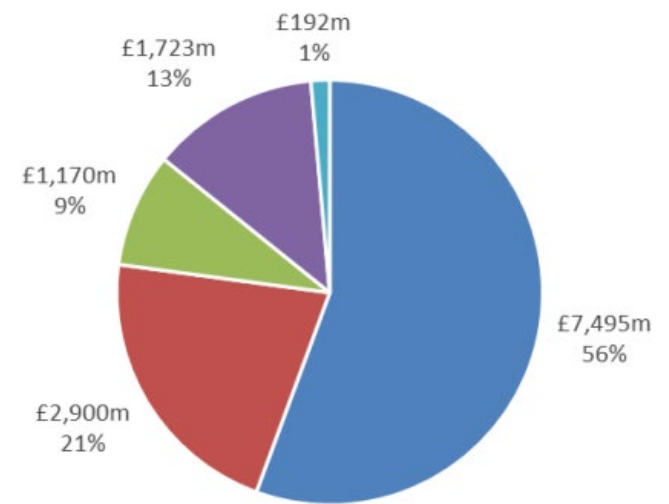
The CBA in Great Britain concluded that the benefits from the smart meter programme were broadly evenly divided between customers and utilities

**Total Benefits for the Advanced Metering Programme of £19.5bn<sup>1</sup>**



- Consumer Benefits = £7,623m
- Supplier Benefits = £8,071m
- Demand Shifting Benefits = £1,363m
- Network Benefits = £374m
- Carbon and Air Quality Benefits = £2,026m

**Total Costs – for the Advanced Metering Programme of c. £13.5bn<sup>1</sup>**



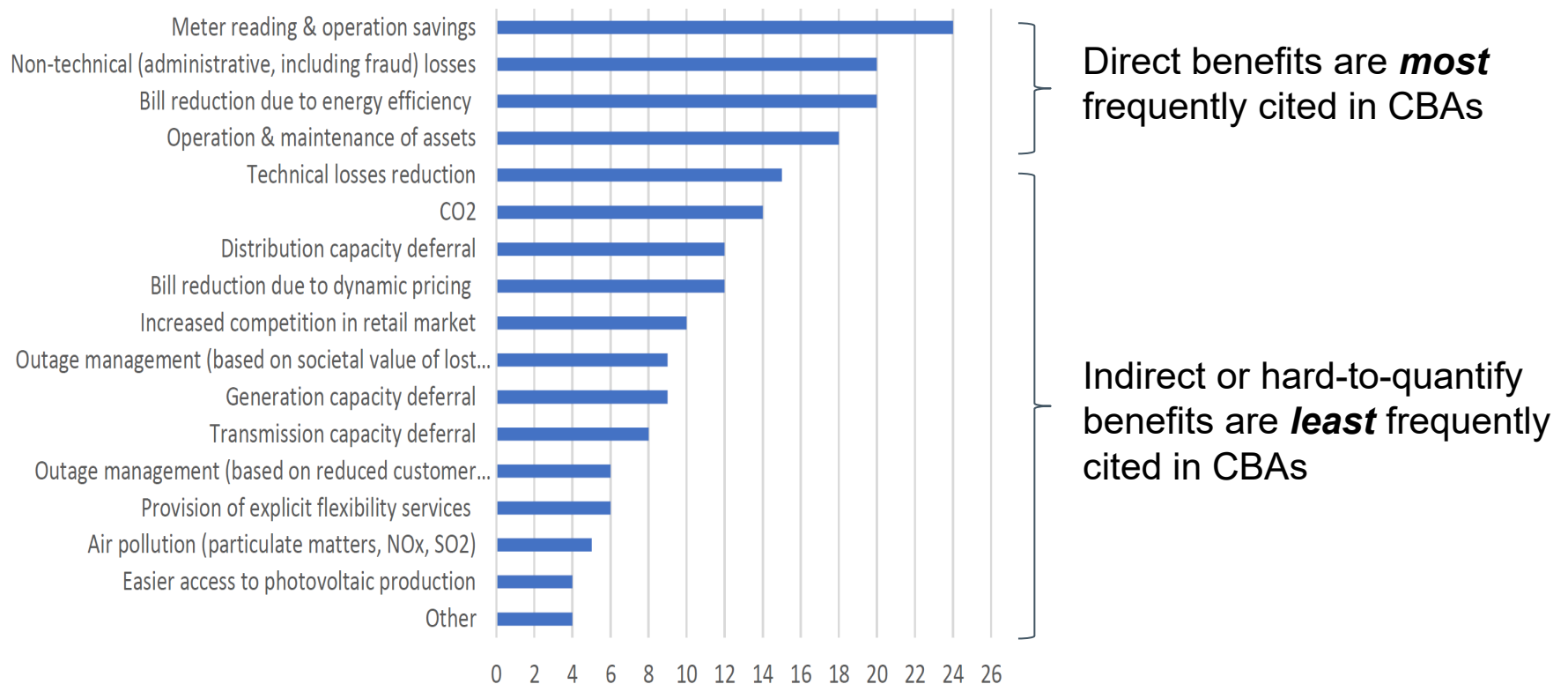
- In Premises Costs = £7,495m
- DCC Related Costs = £2,900m
- Suppliers' and Other Participants' System Costs = £1,170m
- Other Costs = £1,723m
- Projected Future Costs = £192m

Direct benefits need not reflect the ultimate beneficiaries in the long-run as competition or regulation feed lower costs through to consumers as lower prices

1. BEIS (September 2019), Smart Meter Roll-Out: Cost-Benefit Analysis (2019), Figures 2 and 3

# Despite generally positive results and common guidelines, European CBAs have taken different approaches to the inclusion of costs and benefits

## Count of benefits by category across European CBAs for AMI deployment

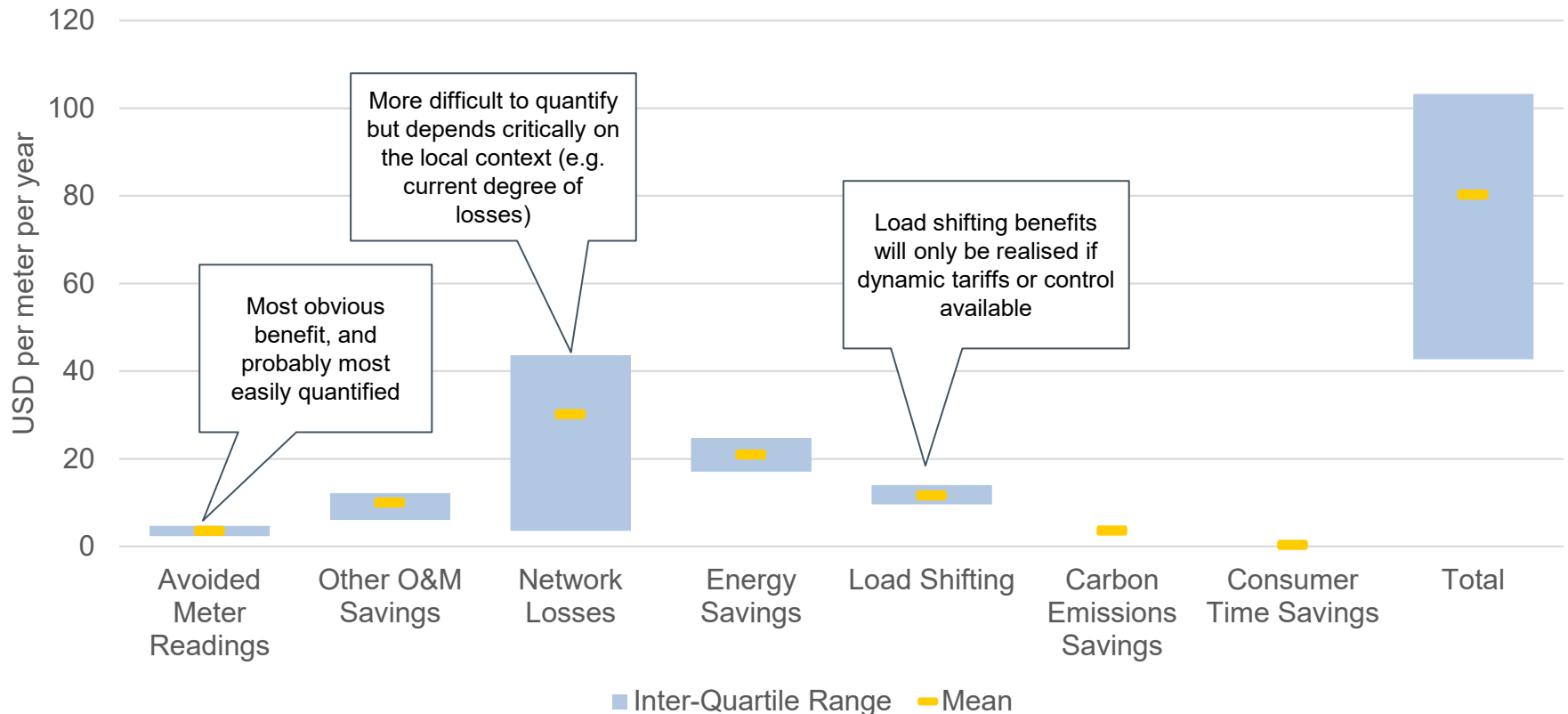


Missing categories of hard-to-quantify benefits would indicate that Benefit-Cost ratios are understated in some CBAs (although assumptions may of course be optimistic in others)

1. Source: European Commission (2019): „Benchmarking Smart Metering Deployment in the EU-28“

# Indirect or hard-to-quantify benefits may be amongst the most important categories of benefits from smart meters

## AMI benefits estimated in CBAs of AMI deployments internationally, normalised for Philippine characteristics<sup>1</sup>

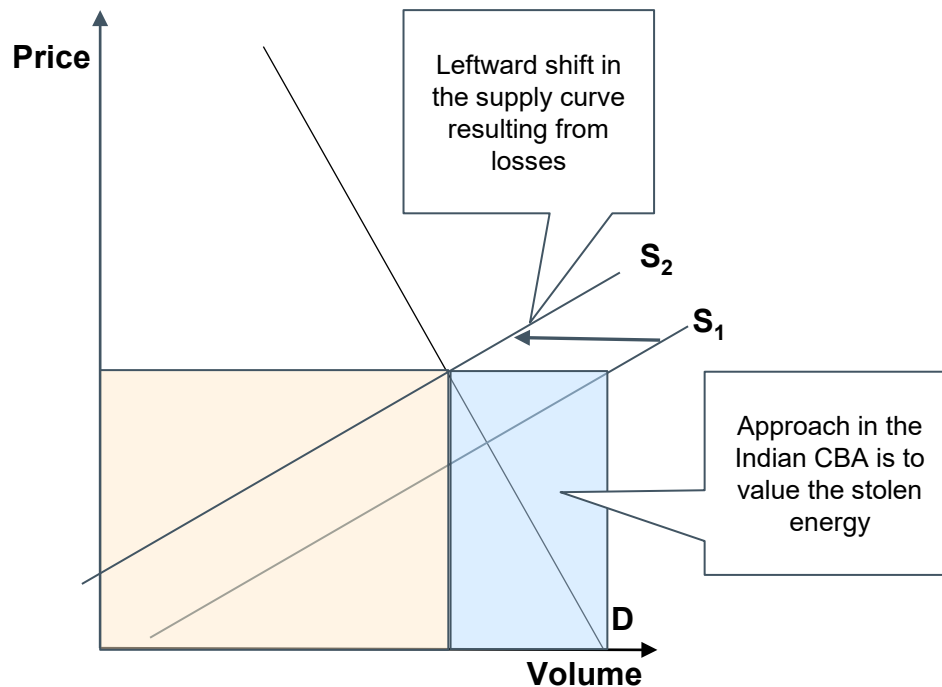


Variation in the costs and benefits estimated depend partly on local context, but also on *conceptual* and *empirical* differences between different CBAs

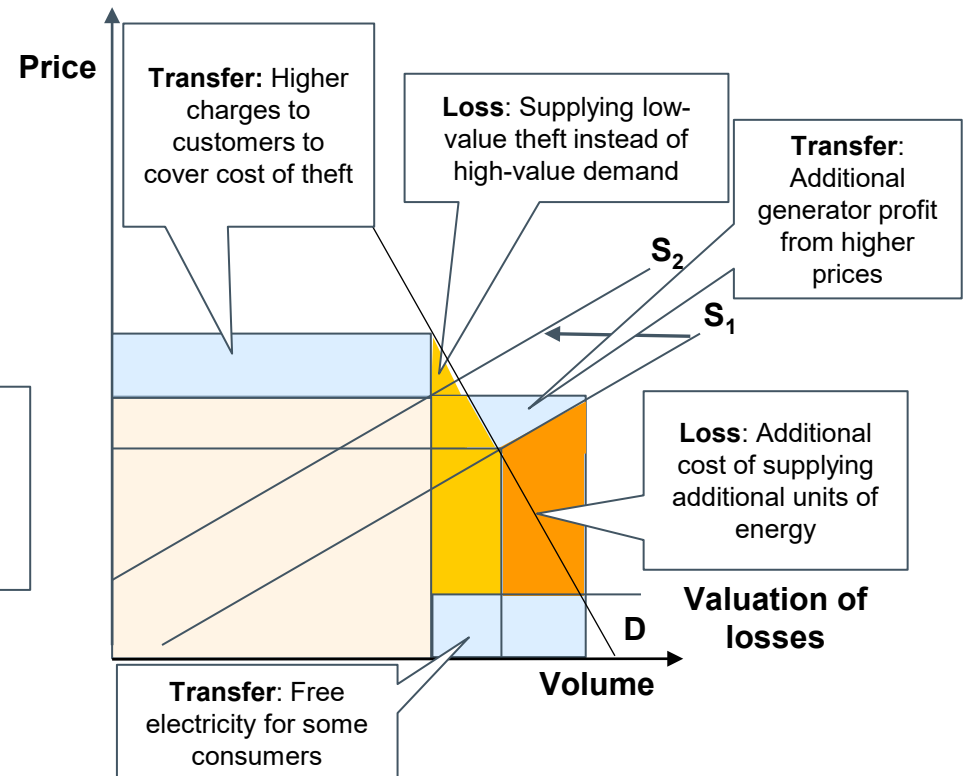
1. Based on a NERA meta-analysis of AMI benefits across a sample of EU-27, Great Britain, India and Nevada. NERA has adjusted estimates for each country or state for economic factors including consumption volumes, costs of generation, and labour costs.

Studies identify *conceptually* different values as the benefit of reducing Non-Technical losses, using methods that frequently result in inaccurate estimates

### Case 1: Valuing losses at the total value of “Non-technical” losses (i.e. theft)



### Case 2: Actual impact of non-technical losses on social welfare

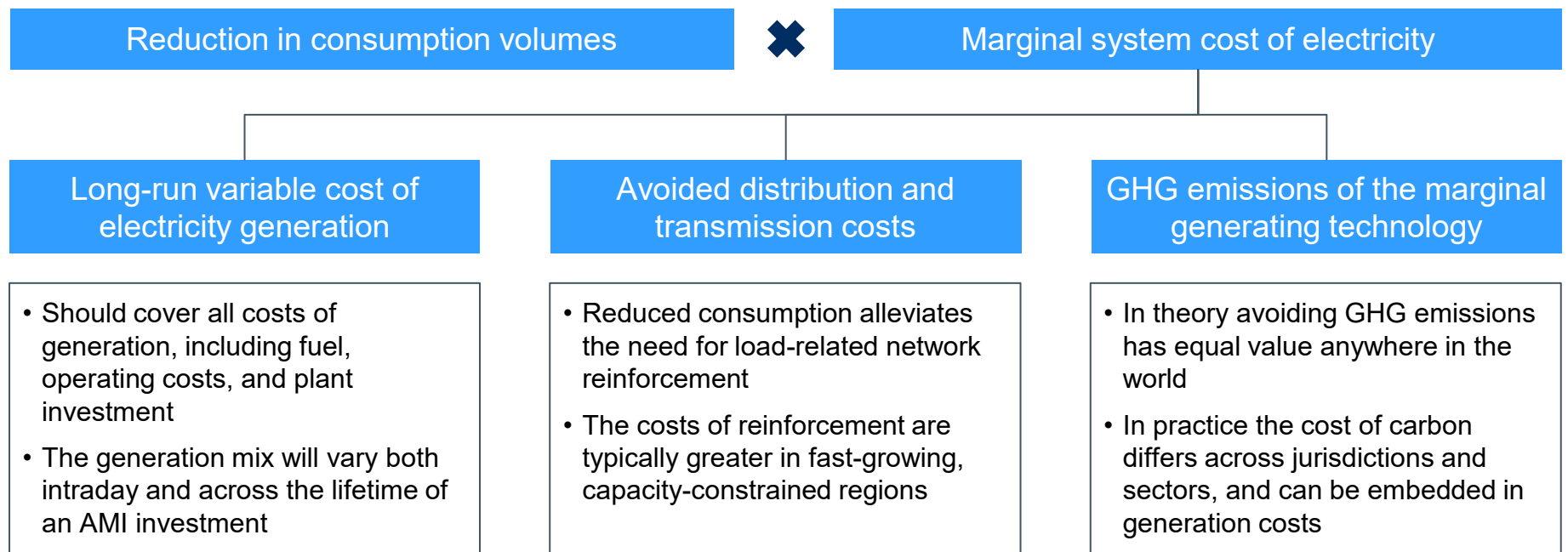


In assessing costs and benefits, regulators and policy makers need to be careful to ensure that they are measuring *social costs* not merely *transfers* (or at least are clear about what losses they incur)



# The benefits from avoided energy consumption are well understood, but methodologies differ in their *empirical* approach

## Avoided cost of energy consumption



Marginal costs are market-specific and can be harder to assess in the long-run than average costs, but are typically also higher and can contribute to one the largest categories of benefits

# Assessing the benefits of Advanced Metering Infrastructure requires careful economic analysis; Delivering those benefits requires careful regulatory design

## Experience on *assessing* costs and benefits

Hard to measure benefits may be large

Differences in methodology as important as in local context

Existing CBAs allow for meta-analysis and cross-checking

CBAs indicate that AMI programmes are anticipated to realise net benefits

## Experience on *achieving* benefits from delivery

Ensuring a timely delivery is critical

Load-shifting benefits require close to real time settlement

Data-sharing between networks and retailers is critical

Network led roll-out less likely to suffer from programme-wide delays

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Successful programmes integrate deployment of AMI with reforms of market arrangements that enable and incentivise efficiencies

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