The Growth Potential for Microgeneration in England, Wales and Scotland

Ofgem Microgeneration Discussion Day

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Description of the consortium

Element Energy – a low carbon energy consultancy, were responsible for project management, design and modelling work.

TNS – a market research consultancy carried out the extensive consumer survey work

Ken Willis - Newcastle University – was the economic adviser on the project and carried out the statistical analysis of survey results

Alistair Munro - Royal Holloway University – acted as an independent reviewer of the project.

Structure

Description of the project approach

Key consumer survey findings

Modeling assumptions

Results

Key conclusions

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Understanding microgeneration consumers is key

For microgeneration technologies to achieve **meaningful penetration, uptake is required in the millions** of units.

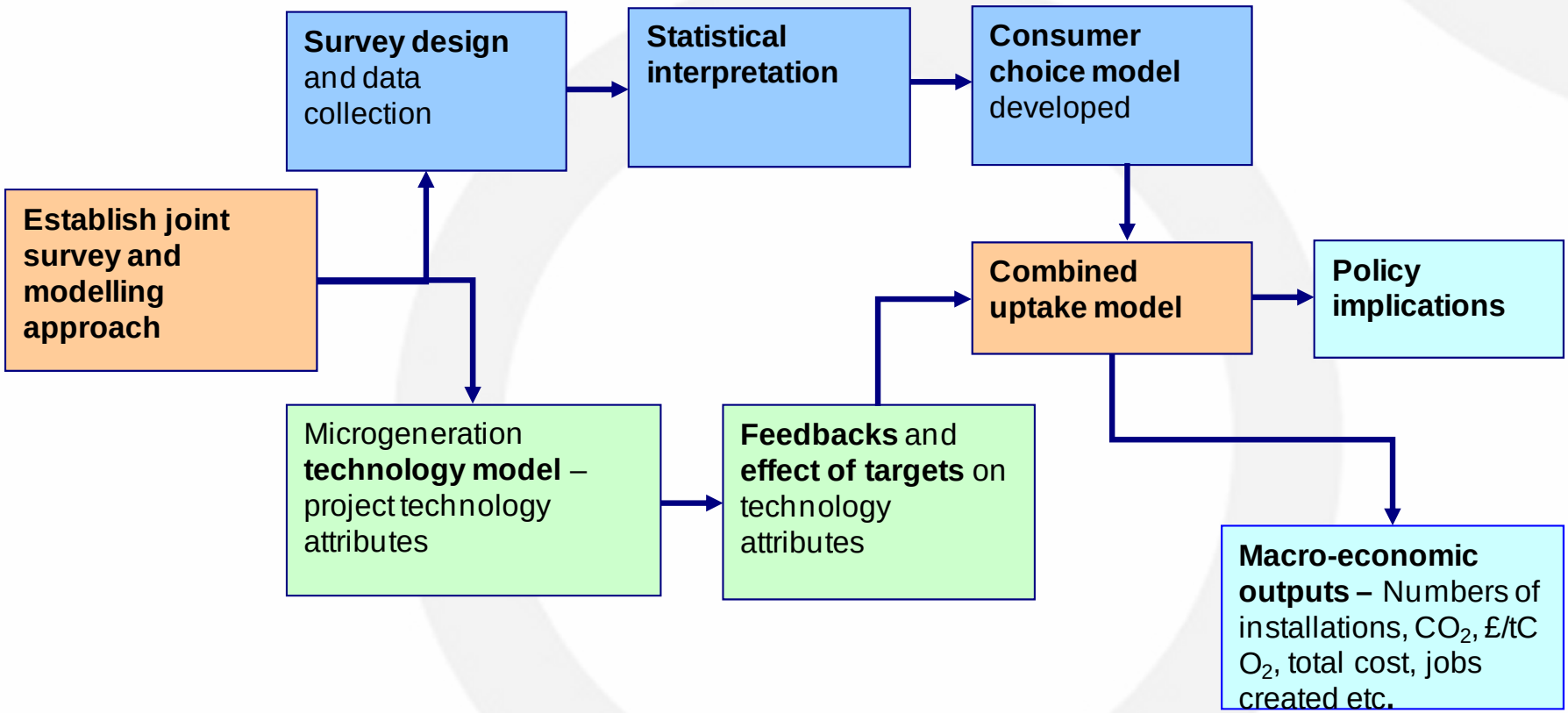
For example, electrical microgen units contribute approximately 1 kW of electricity per installation.

The UK grid capacity is approximately 70 GW, or 70 million kW.

Understanding the interaction between **mass consumer uptake** and likely microgeneration **technology development** is key.

This study attempts to combine the two.

Description of the project approach



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Key attributes identified by focus groups

From focus groups, the key attributes which will have the largest effect in consumer decision making with respect to microgeneration are:

- Capital cost
- Fuel costs
- Maintenance costs
- Hassle factors – such as digging up gardens or taking space
- Recommendation from a friend or heating engineer
- Lengths of contracts required

Consumers differentiate primary heating system decisions from ‘discretionary’ purchases such as installing PV or a wind turbine.

Key results from the house-holder survey

- The most significant result is the very **short time horizon** displayed by consumers for energy related decisions.
- Consumers would only pay £2.90 up-front for a yearly fuel saving of £1.
- This makes microgeneration uptake challenging.
- Consumers are also far more **sensitive to maintenance costs** than fuel bills.
- House-owners are generally **satisfied with their heating systems**.
- No significant regional variation in consumer priorities

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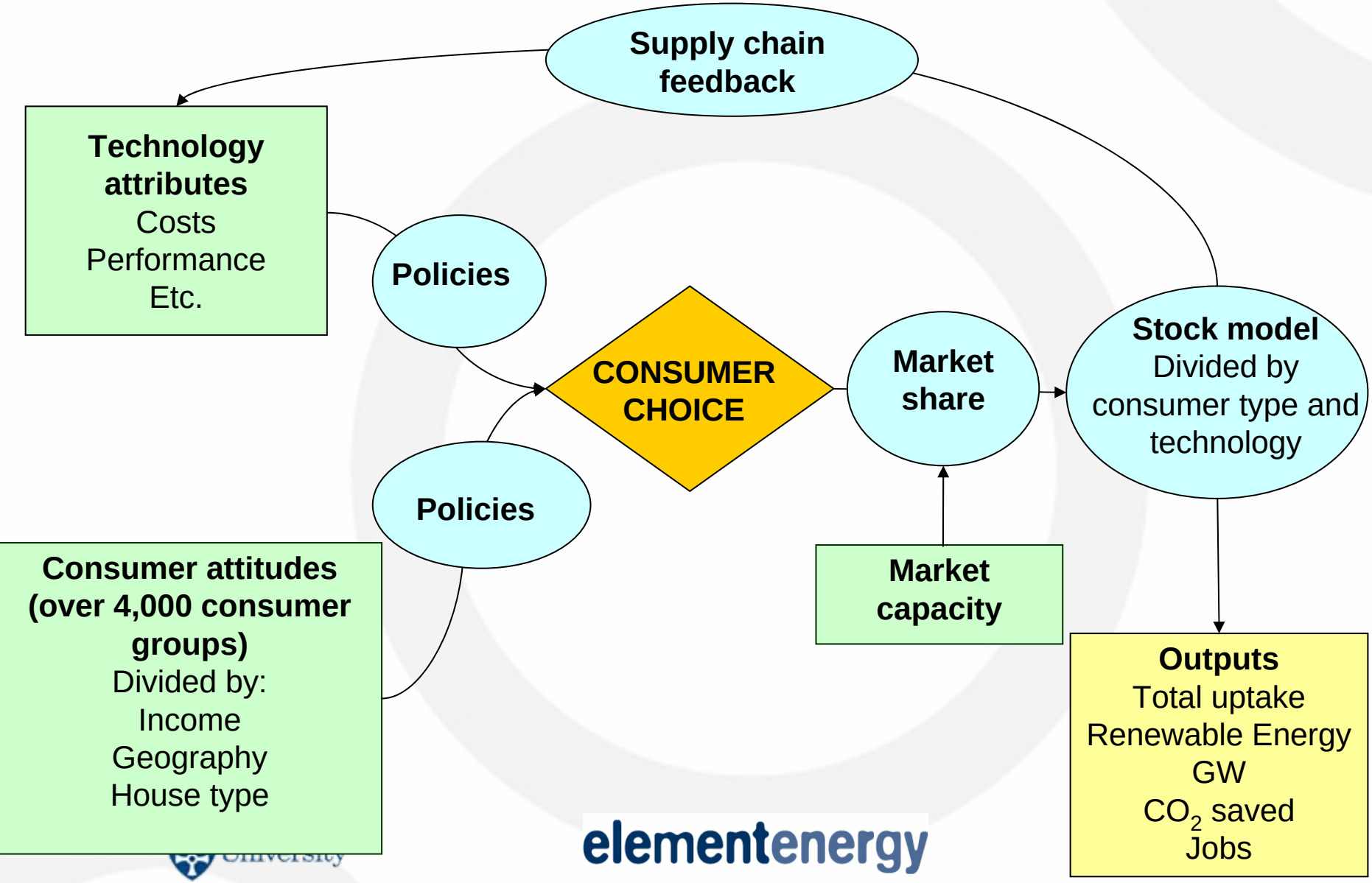
Model schematic



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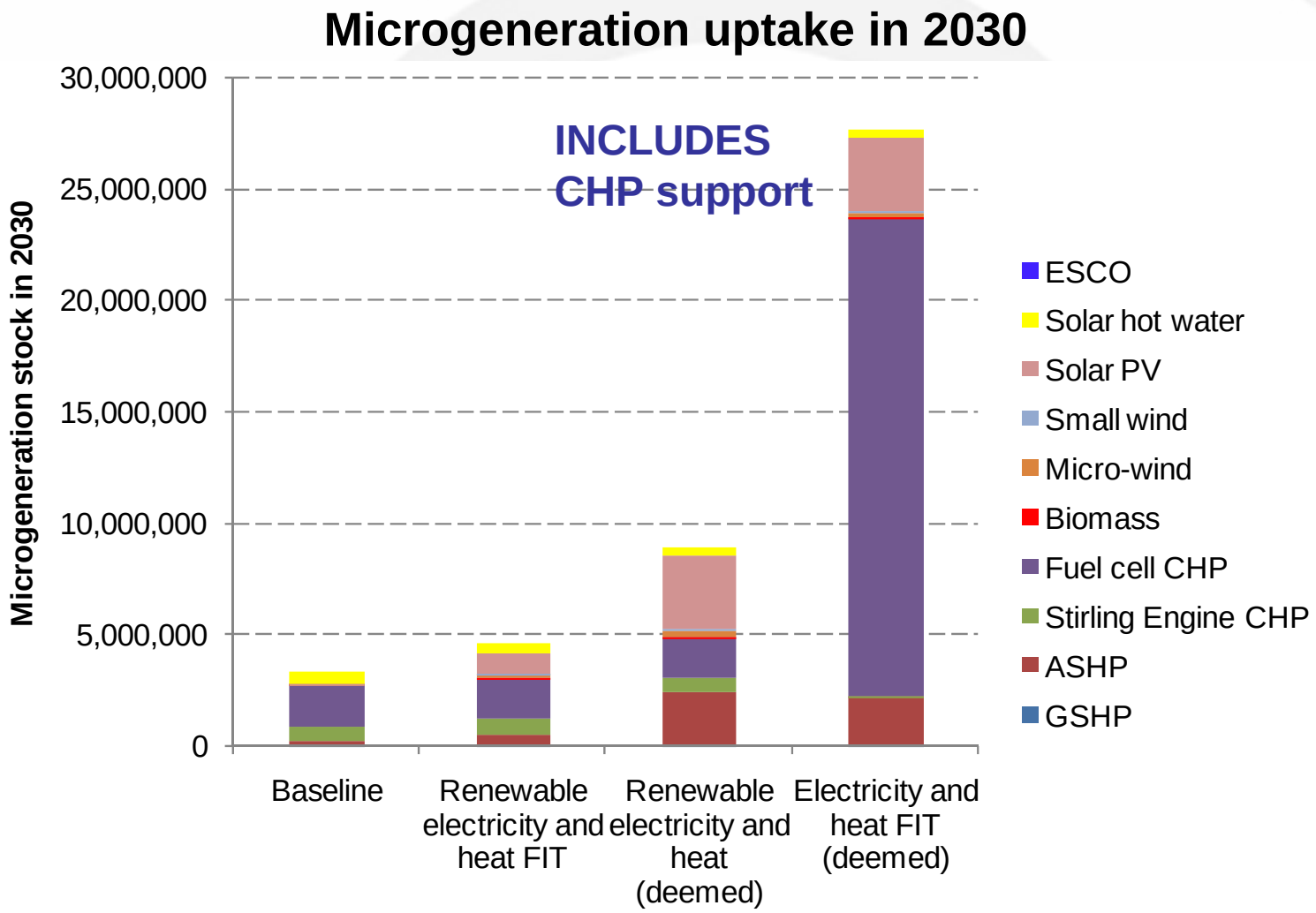
Revenue support schemes are most effective when 'deemed'

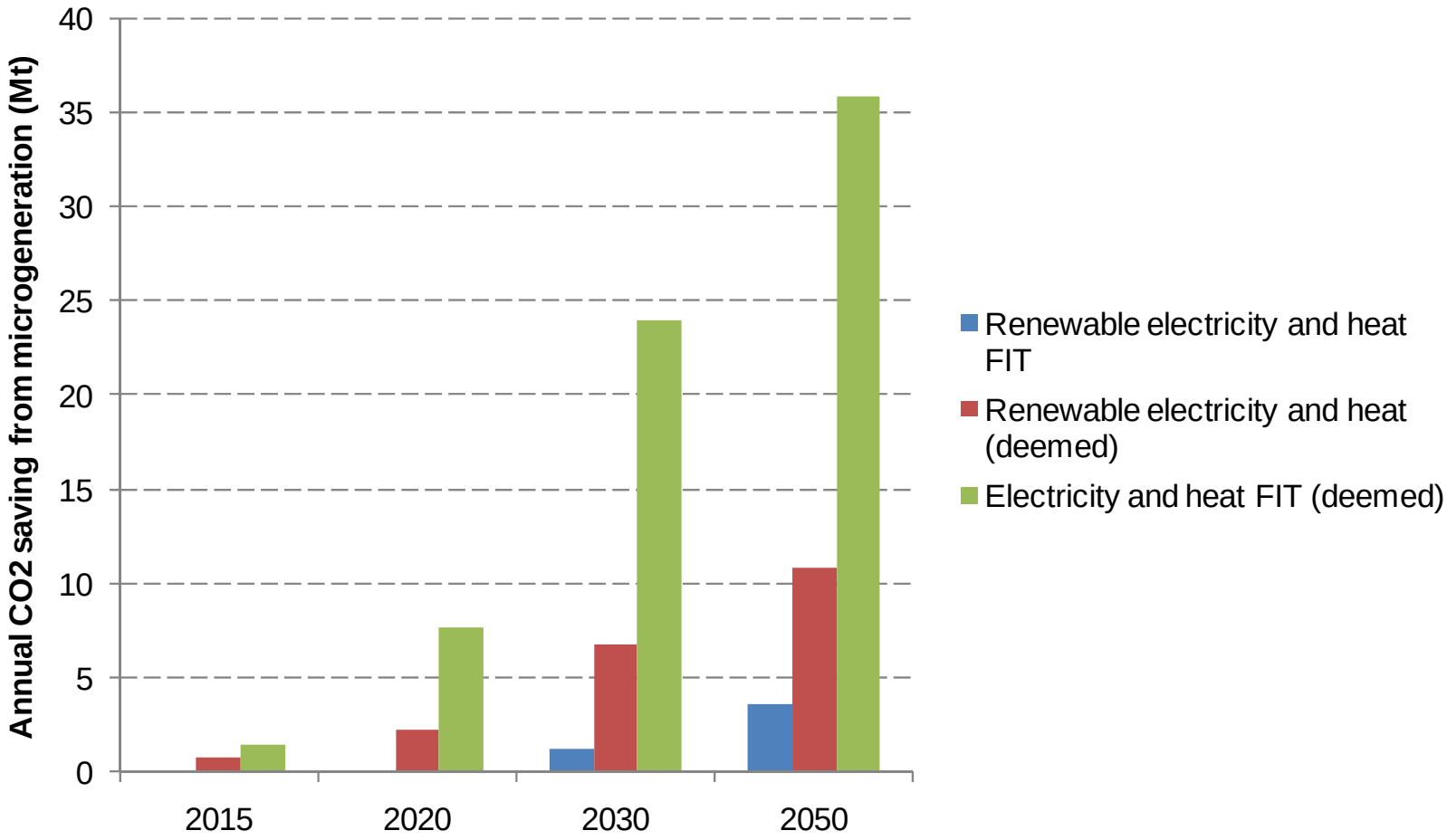
Additional revenue support of 40p/kWh$_e$ for renewable electricity, 2p/kWh$_{th}$ for air source heat pumps and 5p/kWh$_e$ for CHP electricity



The additional CO_2 saving is substantial

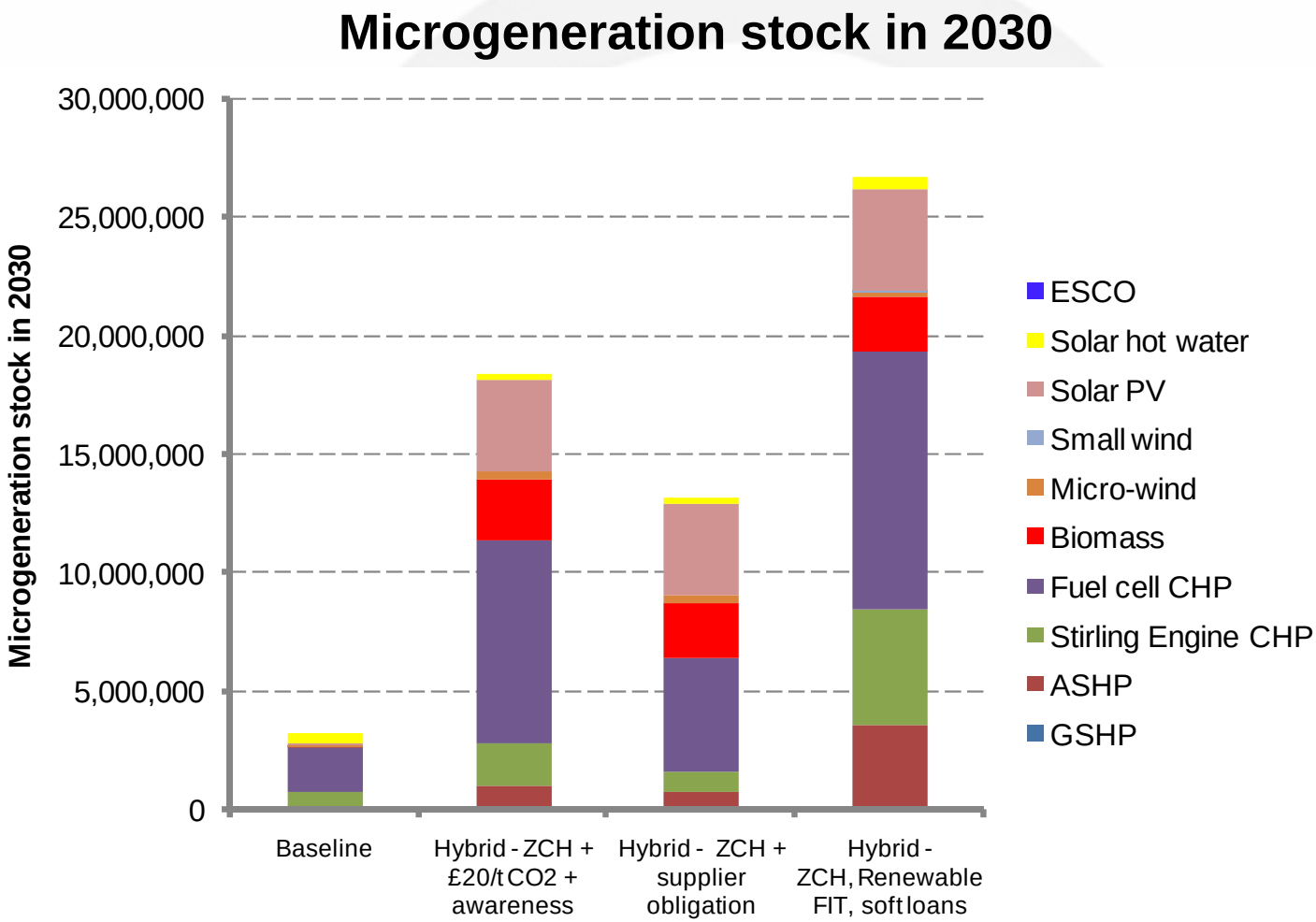
The cumulative subsidy spend is significant **£21 billion and £76 billion in 2020 and 2030.**

CO2 emissions savings (above the baseline)



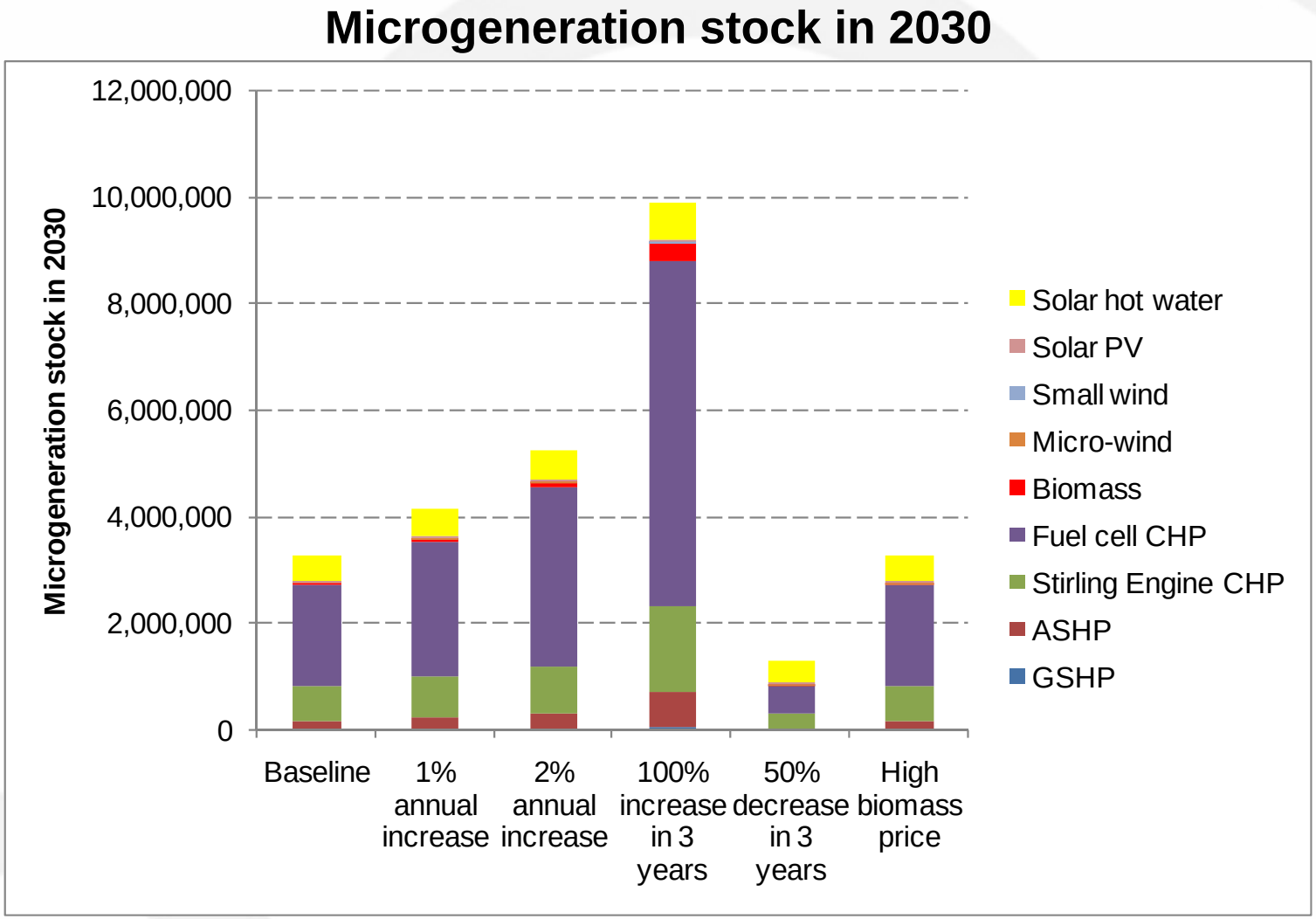
Combined scenarios are perhaps the most effective solution

Combining a series of different approaches leads to policies beneficial to all technologies.



Results are sensitive to fuel price assumptions

Large reductions or rises in fuel price will have a substantial impact on microgeneration uptake.



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Main conclusions (1)

- Consumers place a **very low value on ongoing energy costs** (and no significant value on CO_2).
- This presents a considerable barrier for microgeneration technologies with high up-front costs and low on-going costs.
- In today's environment, no microgenerator offers a compelling economic case compared to the incumbent.
- In other countries rapid uptake has occurred only where sustained policies fit with local needs – e.g. German PV support
- In the UK uptake has been more limited, over 11 policy measures aimed directly or indirectly at microgeneration – none of sufficient scale to promote a mass market

Main conclusions (2)

- Current policies are likely to lead to slow uptake of only the most cost-effective microgeneration by 2020, increasing towards 2030.
- This is sufficient to save over 2.6MtCO_2/year compared to a scenario without microgeneration (total UK emissions are 556 MtCO_2/year).
- Key policies are the Supplier Obligation and and reduced rate of VAT (5%)
- Other announced measures such as the 2 ROCs for microgeneration electricity are projected to have a negligible effect.
- However, with greater support, microgeneration technologies can contribute **up to 30 MtCO_2 reduction by 2030** - equivalent to a 5% cut in total 2006 UK CO_2 emissions.
- This is equivalent to removing the emissions from all Heavy Goods Vehicles and Buses from UK roads.

Successful policy interventions

- A **long lasting incentive scheme**, decreasing in value as technology costs reduce.
- Support levels required today to stimulate substantial uptake are:
  - 40p/kWh for renewable electric technologies (PV and wind)
  - over 5p/kWh for microCHP-derived electricity
  - over 2p/kWh for heat technologies (promotes ASHP especially).
- These schemes can be decreased over time to force cost reduction and reduce costs.
- Cost of these schemes will be high (cumulative £10's of billions)
- Intervention to **capitalise benefits** (capitalise subsidies, or ongoing savings)
- **Zero Carbon Buildings** - the level of support for microgeneration depends offset electricity rules.
- A version of the policy which prohibits off-site electricity, but allows electricity import for heat pumps would stimulate all technologies.

Successful policy interventions (2)

- Much of the CO_2-saving potential for microgeneration comes from **immature technology.**
- The report assumes cautiously optimistic availability and cost reductions in the immature microgeneration technologies.
- **Large scale field trials** or an early public procurement scheme (100's to 1,000's of units) would be highly beneficial.
- Continued **consumer campaigns** to improve consumer accounting for energy-based decisions.
- Carefully selected **combinations of policies** are likely to be more cost-effective and attractive to a wider audience than single policies.

It is also important that microgeneration policy is made in the context of the **broader energy debate** (policy, overall framework etc.).

Microgeneration technologies do not always benefit from being lumped together for policy making.

Targets

- Potential targets were announced in the 2006 **Climate Change and Sustainability Act.**
- The main value of targets is to bring forward cost reductions, through increased confidence for the supply chain.
- Targets without policy backing have no value in bringing forward technology investment.
- Targets **backed up by policy** could help to support investment
- If government is prepared to alter microgeneration based policies, then this can be backed up with a target at relatively low cost.
- There is little point in establishing targets without the **appetite for the policy**.
- The target most likely to stimulate investment is **specific about sales volumes** and hence a “units installed” or “sales per year” target .

Targets

The model analysis suggests that a number of plausible policies could lead to well over 2 million installations by 2020, with a possible stretch target of 3 million installations by 2020.

Activity by 2015 is limited as the zero carbon homes policy is not yet established and many technologies have not yet fully matured.

2015 – 500,000 units installed

2020 – 2-3 million microgeneration units installed

Depending on precisely how the policies are devised, these targets would correspond to 0.2- 0.5 Mt CO_2/year saving with respect to the modelled baseline in 2015, and 1-2 Mt CO_2/year saving in 2020.

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Ceres Power
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Many thanks for your attention.

For further details, please read our report
“The Growth Potential for Microgeneration in England, Wales and Scotland”
Available at
http://www.berr.gov.uk/files/file46003.pdf

Technical appendix available at
http://www.berr.gov.uk/files/file46421.pdf

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