

Delivering energy efficiency in the UK through Domestic Energy Service Companies (DESCos)



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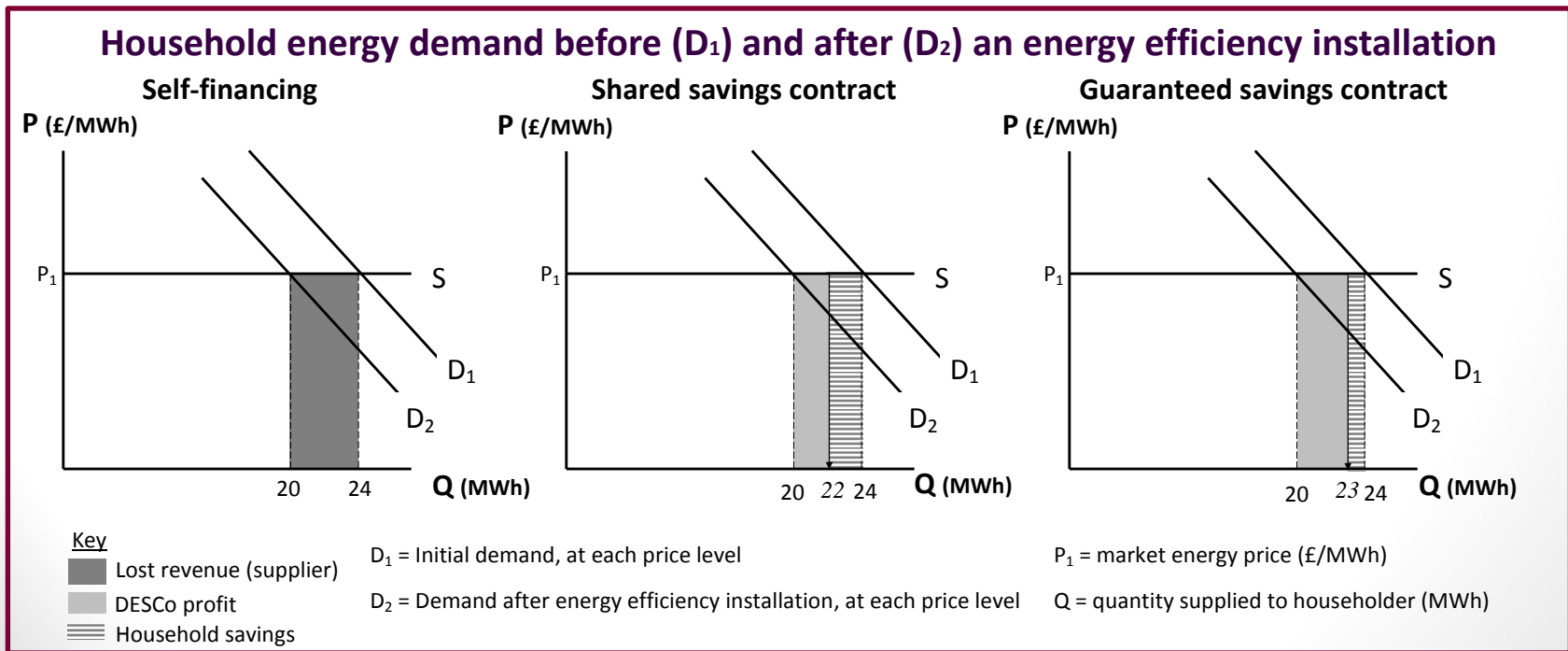
M.Res Energy Demand Studies

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The energy efficiency gap

- ~51% domestic cavity walls un-insulated*
- Barrier theories:
 - techno-economic (e.g. high risk, capital, hidden costs)
 - socio-cultural (e.g. lack of status->consumer inertia)

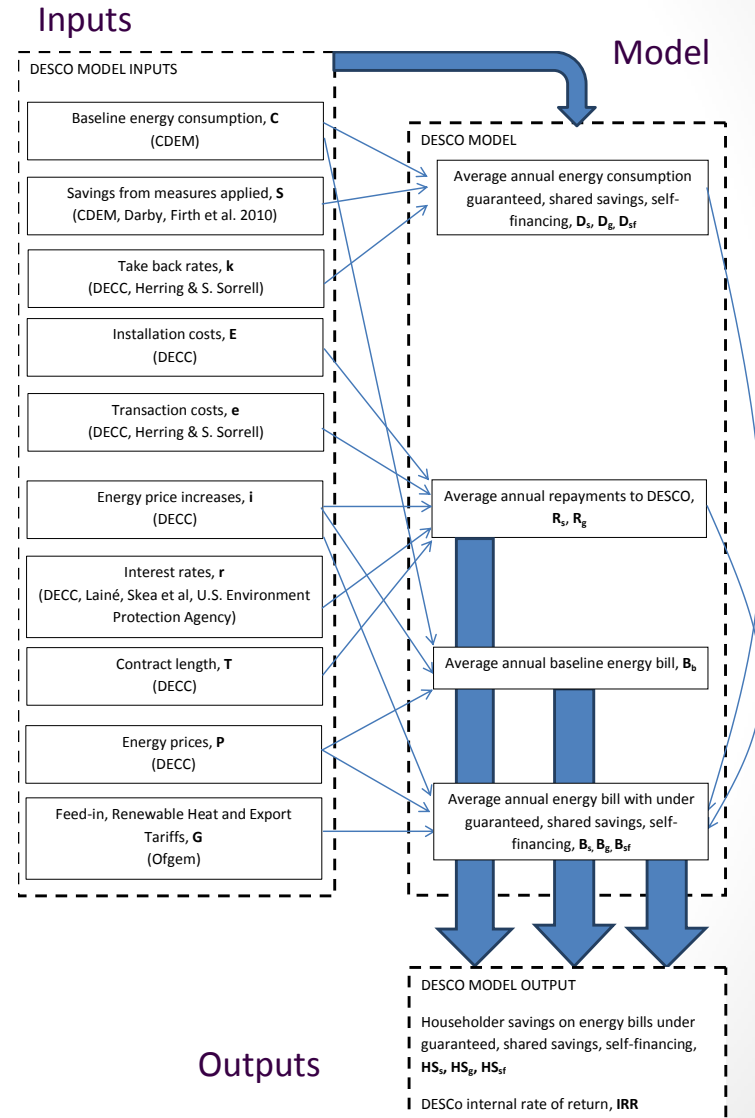
➤ **Do DESCos have the capacity to close the energy efficiency gap?**



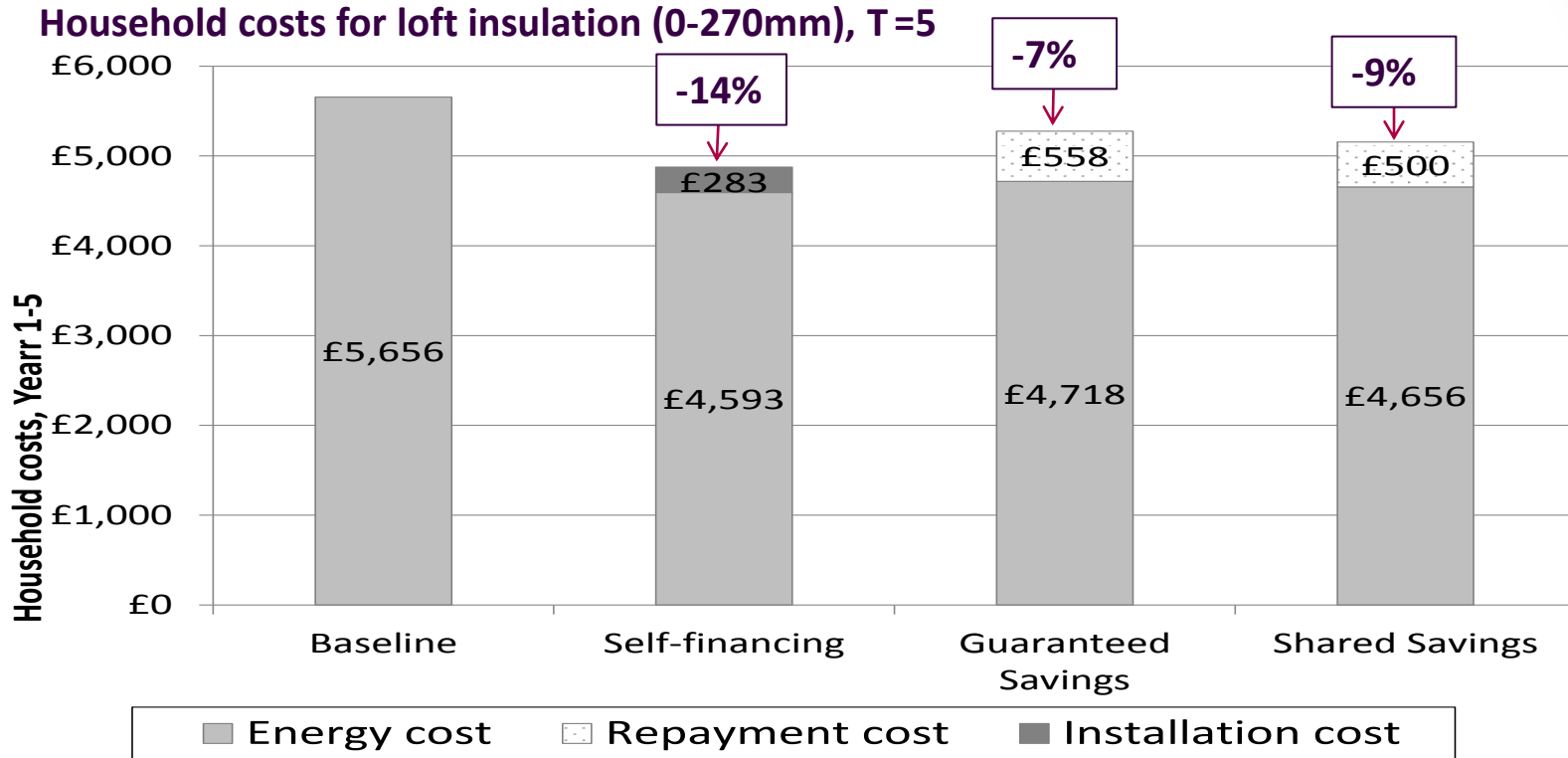
* Source: Department of Energy & Climate Change 2011a

Energy / Finance Model

- Un-insulated 3-bed semi
 - Baseline consumption (C)
 - % savings from measures (S)
- Take-back rates (k)
- Transaction costs (e)
- Energy price increases (i)
- Household savings on baseline: $HS \geq 0$
- Internal rate of return: $IRR \geq r$



Results – single measure



DESCo costs and returns for loft insulation (0-270mm), T=5

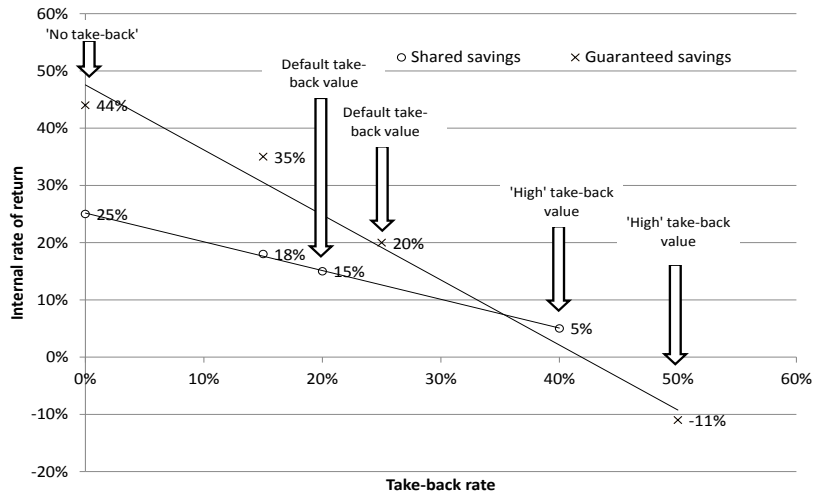
	Guaranteed Savings	Shared Savings
Total costs	£334	£334
Annual repayments^a	£112	£100
Internal Rate of Return (IRR)^b	20%	15%

^a A function of interest rates, annual price rises, contract length, investment cost

^b A function of total costs, annual repayments and contract length

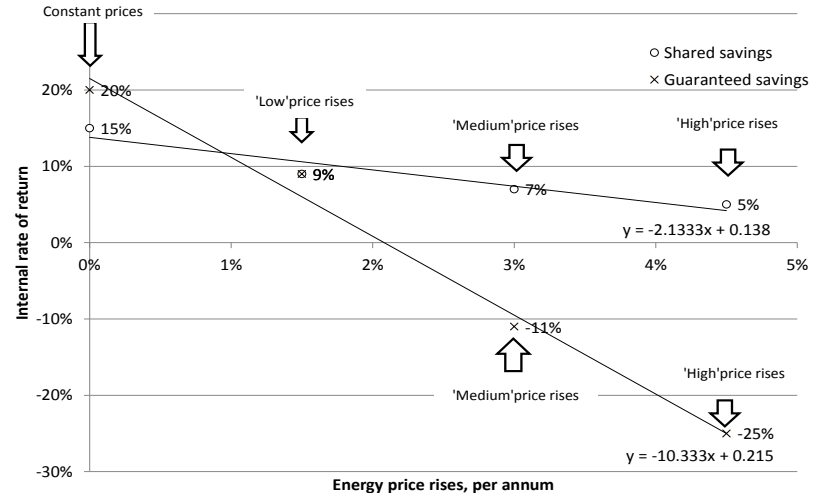
Iterations – single measure

Take-back rates against IRR
for loft insulation (270mm),
 $T=5^*$



* With fixed household savings

Energy price rises against IRR
for loft insulation (270mm),
 $T=5^*$



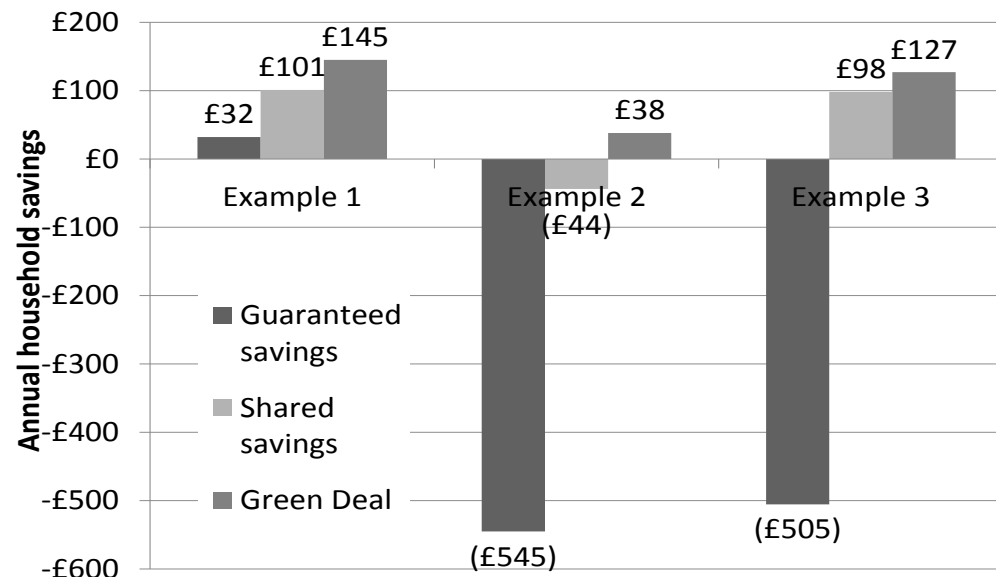
- GS: DESCo absorbs full reduction in savings
 - SS: DESCo absorbs half reduction in savings
- **Managing take-back and energy price rises critical**

Results - Viable contracts

Length	Type	Measure/s
5 years	Guaranteed / Shared	Loft insulation, cavity wall insulation, draft-proofing, demand side measures
10 years	Shared	Low cost heating with 50% funding from householders
25 years	Shared	Internal wall insulation (with 55% subsidy) and 3kWp Solar PV (with 50% funding from householders)

Versus Green Deal

- Low cost: £30-100 p.a. savings
- 'Whole house': £100 p.a. savings



Limitations

- Viability criteria ($HS \geq 0$, $IRR \geq r$)
- Only 1 house type used
- Default values (esp. take-back factors and transaction costs)
- Savings: model vs. reality

Conclusions

1. DESCos could be a viable means of financing energy efficiency
2. DESCos may be better equipped to close the energy efficiency gap than the Green Deal

	Risk	Information	Capital	Hidden costs	Split incentives	Bounded rationality	Consumer inertia
Green Deal	X	Free tailored advice	No upfront cost	X	Loan tied to property	X	X
DESCo	Reduce performance risk to householder	Free tailored advice	No upfront cost Lower returns required	/ DESCo management can reduce hidden costs	Contract tied to property	X	Offers fixed price contracts

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