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## Energiesprong UK – finance model

### Introduction

The purpose of the financial model is to establish the financial envelope that is available for an E=0 retrofit based on existing building characteristics and reduced operational cost post refurbishment (enabled by the E=0 performance warranty for 30+ years). This approach implies that properties with the highest planned investment through repair/maintenance and major repairs will have the largest scope for investment; these are likely to be properties with poor energy performance and in relatively dilapidated state. As industry innovates costs for E=0 retrofits come down, thus a smaller financial envelope is sufficient to implement the solution.

Early demonstrators of Energiesprong implementations should therefore be chosen on the basis of already high planned investment (for maintenance and major repair works) and other properties should be added as the cost / unit goes down.

The Energiesprong concept is based on the assumption that the capital investment required to deliver net-zero energy refurbishments is covered by:

- Aggregating planned routine & maintenance and major repairs cost over a 30 year period (the period of the E=0 retrofit performance warranty)
- Creating an ‘energy plan’ for tenants (which is equal or less than their current combined utility bills) which is then paid to the housing provider (additional revenue stream)

### Preliminary results (based on V1.3)

Using a mid-terrace house (77 m<sup>2</sup>; 2 storeys, built between 1930 and 1949, on dual fuel gas and electric), owned and managed by a housing association (HA) the following investment envelope is calculated:

- £42,293 capital investment for an Energiesprong installation (NPV-based)
- £17,128 for 30 years Energiesprong-related maintenance (£571 per annum)
- £11,420 for 30 years non-Energiesprong-related maintenance and major repairs (£380 pa)

This TCO (total cost of ownership) of this reference case is £71k (c.91.470 EUR) is lower in comparison to NL and FR.

Underlying assumptions for this calculation:	Post Energiesprong assumptions:
• 6.5% discount rate	• 11kW energy storage included
• 4.2% cost of borrowing	• £80/month energy plan (CPI-linked)
• 30 year term; 100% debt finance	• 1% bad debt on energy plan
• Management cost, Planned & Routine Maintenance, Major Repairs cost as per sector averages (HCA Global Accounts 2014)	• 10% reduction in management cost • 25% reduction in planned & routine maintenance (of which 75% available for ES maintenance; 25% non ES) • 75% reduction in major repairs

Based on the modelling work to date there are a number of opportunities to increase the financial envelope for an Energiesprong investment; these can be divided into internal (e.g. housing providers themselves can take decisions) and external aspects (needs somebody else to assist). Please note that the following example calculations are stating the increase in the financial envelope for that specific measure compared with the reference case; it is possible to combine a number of the proposed measures to tune the finance model.

Internal decisions that would increase the financial envelope:

- Increase the building lifetime post Energiesprong. The business model allows for a lifetime extension of the building post Energiesprong but the presented results are based on the same lifetime before and after an Energiesprong installation. In the Dutch business model the lifetime of the building is extended by 25-40 years which adds significantly to the financial envelope. In the UK business model a lifetime extension of 5 years on the reference case increases the investment envelope to £65.5k + £20k ES maintenance + £13k non-ES maintenance.
- Allocate 100% of major repair cost to Energiesprong. The business model currently allows for a residual major repairs budget (25% of pre-Energiesprong budget) to cover any works outside the Energiesprong solution. This would bring the investment envelope for Energiesprong up to £45.5k against the same reference case.
- Adding rental income to Energiesprong finance. The business model currently assumes that rental income is not used to repay the Energiesprong investment. This is a reflection of the current business model of housing providers not to use rental income for stock improvements. Adding 10% of rental income to refinance Energiesprong would increase the investment envelope to £52k.

External factors that would improve/impact on the financial envelope:

- Reduce the cost of finance. The business model uses two default finance rates: 2.8% for LAs and 4.2% for HAs. Bringing the cost of finance down to LA-rates (2.8%) increases the investment envelope for Energiesprong to £50k; a borrowing rate of 2% would result in £56k.
- Total cost of living/rent flexibilities. The energy plan carries an element of risk for the housing providers; greater flexibility in rent setting (e.g. linked to energy performance) and/or establishing a total cost of living (rent + service charges + energy charge) could reduce this risk. Equally a charge attached to the property (using Green Deal legislation) could decouple the energy plan risk from the housing provider and give an opportunity to third party investors (on the back of the long term energy performance contract).
- Increase in FiTs/link energy generation + export tariffs to consumption tariffs/net metering. The current business model has to assume a proportion of energy that is purchased at retail price to cover undersupply from the on-site generation (e.g. during winter). Although energy storage can overcome this issue to an extent the business model still relies on paying for energy at a price 3 times higher than the generation/export tariff. This means Energiesprong solutions in the UK may have to become net positive rather than net zero to make up the shortfall in finance. This is a point to be discussed in more detail between demand and supply (to define exact 'Energiesprong' parameters for the UK) but equally also with DNOs (opportunity to reduce maintenance/upgrade investment) and UK government. This needs to be linked to the wider debate about time-of-use-tariffs as it may be appropriate to consider an intermediary who provider real-time switching on an hourly basis to secure kW-prices below a fixed cost.