

## Pathways Model Guidance

### Overview

This tool estimates the costs and benefits of upgrading every building in Lambeth to a net-zero compatible standard. You can select a target year for “full electrification” (eliminating the use of natural gas to heat our buildings by e.g. 2030, 2040 or 2050), and the tool will calculate how much investment, how many measures, and of what type of measures, are required each year to hit that target.

The blue ‘Dashboard’ tab allows users to update some of the assumptions behind the modelling.

The green ‘Summary charts’ tab allows users to view the outcomes of the modelling. There are graphs showing impacts on upfront investment, energy bills, borough heat demand, carbon emissions, etc.

On each of the graphs there are different modelled retrofit scenarios. These include:

- Business as usual (BAU) – no improvement to the buildings other than ongoing replacements of gas boilers
- Cost optimal full electrification – the most cost effective route to electrification of heat for the building owner, considering upfront costs, maintenance costs and fuel bills over a 30 year time frame
- Lowest CO2 emissions – the route to electrification of heat with the lowest cumulative CO2 emissions
- Electrification with lowest peak load – electrification of heat which results in the lowest peak load (peak load is the highest amount of energy drawn from the grid in a set period of time)
- Electrification with lowest CAPEX – the route to electrification of heat which requires the least upfront investment from the building owner
- Electrification with lowest fuel bills – the route to electrification of heat which results in the lowest fuel bills for the building occupants

For more information on the Pathways Model, refer to the ‘Guidance’ tab of the pathways model spreadsheet.

### Changing the modelling parameters

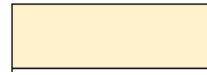
#### **Updating the ‘full electrification of heat’ target year:**

Cell S57 in the ‘Dashboard’ tab allows users to select the target date for full electrification of heat in the borough. Changing this will update all the graphs in ‘Summary charts’ tab to show the impact on upfront investment, CO2 emissions, etc.

For more information on the different user input options, please see below.

## Further information

All cells where manual inputs are possible are highlighted in yellow:



All the below input options are on the blue 'Dashboard' tab.

### **Heat network inputs (columns S & T, rows 38-45):**

- There are 8 heat network zones highlighted within the study
- These cells give the user the option to select which heat network zones become active in which year.
- Enter a year in column T alongside the respective heat network zone to model that heat network becoming active.
- The 'core scheme' is the heat network only connecting to key buildings such as government services and data centres. The 'full scheme' is once all proposed buildings (including residential) are connected.
- The user can also decide if the 'core scheme' is built ahead of the 'full scheme', if they are built at the same time, or if the 'core scheme' is built only.
- For example, entering 2025 in cell S38 and 2028 in cell T28 would model the Brixton heat network core scheme to be connected in 2025 and the full scheme to be connected in 2028. Entering 2030 in cell T39 and leaving cell S39 blank would model the Clapham (north) full scheme (including the core scheme) to be connected in 2030. Entering 2023 in cell S44 and leaving cell T44 would model the Waterloo core scheme only to be connected in 2023.
- Any changes in these cells will be displayed in the green 'Summary Charts' tab as the dashed green line on the graphs, i.e. 'Electrification with lowest CAPEX (heat networks)'

### **Rate of BAU heating systems replacement (cell S56):**

- Enter a percentage in this cell to alter the rate of heating systems replacement per year within the BAU scenario
- Any changes in this cell will be displayed in the green 'Summary Charts' tab as the dashed black line on the graphs, i.e. 'BAU'

### **Rate of package deployment (cell S58):**

- Select from the dropdown menu the rate at which retrofit packages will be deployed
- Any changes in this cell will be reflected in all scenarios

### **Manual inputs scenario (columns CS-CX, rows 8-130):**

- Firstly, to view the manual inputs scenario on the 'Summary charts' tab, select 'Yes' in cell CW8.
- These cells give the user the option to manually input uptake for each retrofit scenario per building type
- The default is for retrofit package 1 to be implemented for all building archetypes
- To override this, add percentages in columns CS-CX to model the rate of uptake of the relevant retrofit package

- The entered percentages should never decrease from column CS across to column CX as this would model retrofit packages being removed. The percentages should always increase or stay constant.
- Any changes in these cells will be displayed in the green 'Summary Charts' tab as the dashed yellow line on the graphs, i.e. 'Manual inputs scenario' (only if cell CW8 has been changed to 'Yes')

### Data visualisation options

All the below input options are on the green 'Summary charts' tab.

#### **Scale to 100% of Lambeth's buildings (cell D2):**

- In modelling the 31 most common building archetypes in the borough, rather than modelling every single building archetype, the study does not cover 100% of buildings in Lambeth (for example, some very specific architectural buildings have not been included in the study). As a result, the study covers 94% of Lambeth's buildings
- Cell D2 allows the user to extrapolate the modelled data across 100% of Lambeth's buildings – simply change the cell to 'Yes'

#### **Comparison tables (cells I36 & V36):**

- Cells I36 and V36 allow the user to take a closer look at the data behind each of the modelled scenarios – simply select the scenario from the dropdown list to view the data in the table below