



THE LOW-CARBON TRANSITION OF THE EUROPEAN ELECTRICITY SECTOR: UNDERSTANDING INVESTMENT COSTS AND ACTORS' STRATEGIC INVESTMENT DECISIONS IN RENEWABLE ENERGY GENERATION ASSETS THROUGH AN AGENT-BASED APPROACH



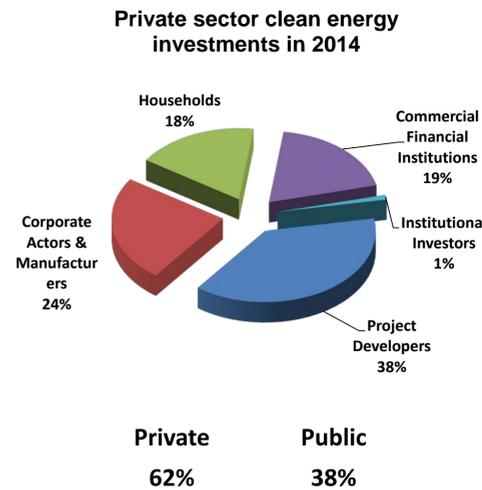
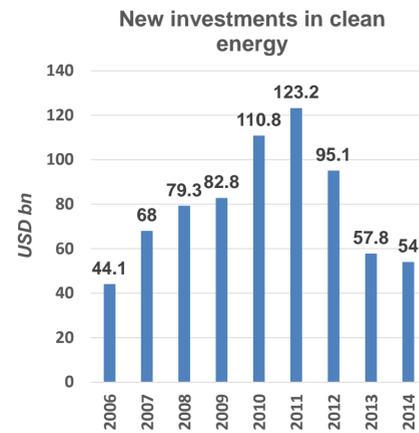
Elsa Barazza: elsa.barazza.14@ucl.ac.uk

BACKGROUND & OBJECTIVE

- European electricity sector facing **deep transformation** and **major investment requirements**
 - Utilities traditional business model under pressure
 - Declining low-carbon investments
- Importance of **private sector actors** and **heterogeneity** of this investors' group
- Path-dependency of energy investments

What drives investment decisions of private sector actors? Under what conditions do they invest more in low-carbon assets?

➔ Explore sustainable way to finance the low-carbon transition



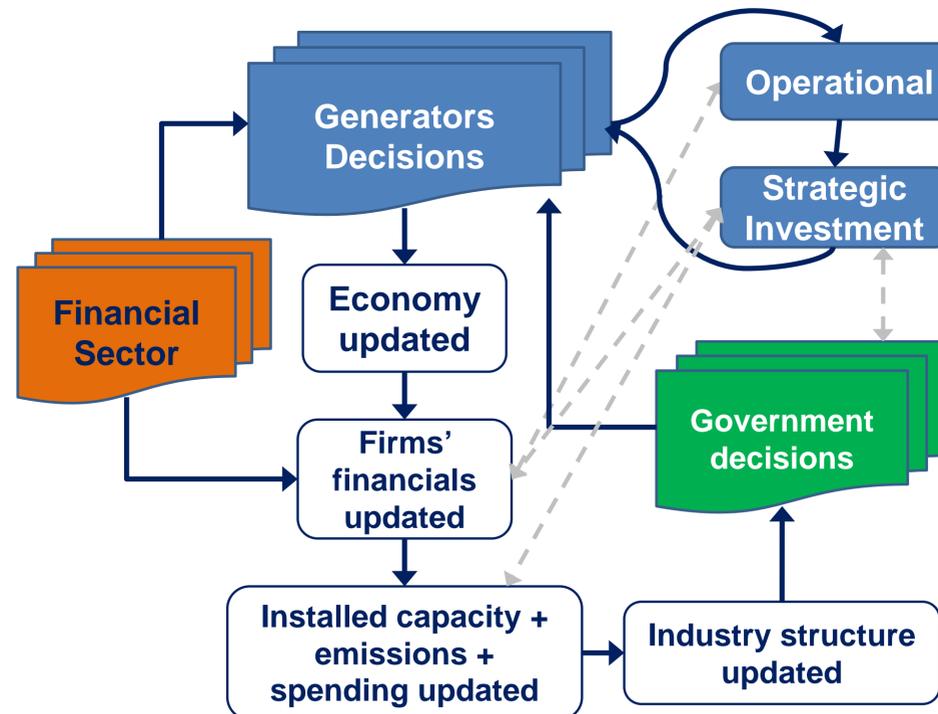
METHOD & MODEL

Evolutionary Agent-Based-Model (ABM)

- Heterogenous actors with bounded-rationality and path-dependent behaviour
- Create actor-based future scenarios of electricity system → *gap in literature*
- Good to model co-evolution of policy and business decisions dimensions
- Good to model the transition of complex and non-linear system = low-carbon transition

3 CASE STUDIES: UK, Germany, Italy

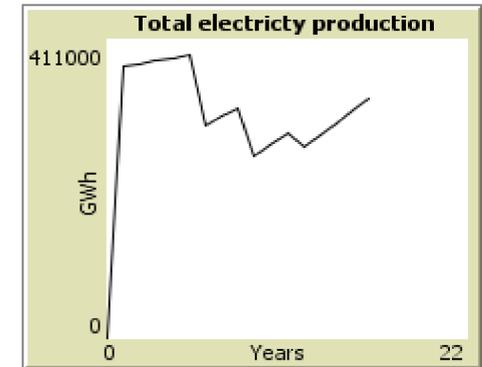
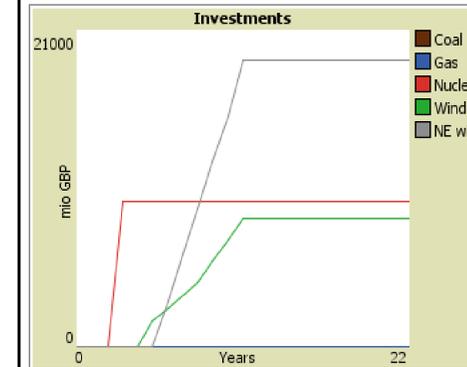
Model Flow: 1 loop = 1 year until 2050



PRELIMINARY RESULTS

UK electricity system from 2013-2035:

- Actors:** one incumbent power generator, the government and one new-entrant
- Investment decisions:** based on ROI, carbon price, and past observations



Correcting mechanisms: government steps in to secure supply

