

# Agent Based Simulation of Technology Adoption

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This paper draws upon techniques originally developed by physicists. We have developed a computer simulation of thousands of householders living in a simplified community. Each householder is a decision-making "agent" with a choice between three possible sources of electricity. These choices comprise traditional mains supply, combined heat and power or solar photovoltaic panels on the roof. This latter technology choice is visible in the neighbourhood. Agents can "see" a neighbour's solar panel installation, and this can give rise to a "fashion effect". Our simulation exhibits the famous S-curve associated with the smooth uptake of a new technology. In some circumstances we observe that the transition between technologies does not occur smoothly, but rather in a series of radical and unstable jumps. We establish which of the simulation parameters are of greatest importance and map the behaviour of the system across the full range of these parameters. In so doing we establish a picture of these phenomena that is reminiscent of a "phase diagram" in physics. Some of the "phase transitions" that we observe appear to be discontinuous, but most interestingly we also have indications of behaviour reminiscent of continuous phase transitions.

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