

# LED there be light The evolution in LED technology and dynamics of entry into the LED lighting market

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Propositions accompanying the thesis:

## **LED there be light**

### **The evolution in LED technology and dynamics of entry into the LED lighting market**

by Emanuela Sirtori

1. Community detection analysis based on the co-occurrence of IPC codes in patents provides a meaningful and agnostic way to classify a large and sparse patent database and identify the technological domains spanned along the technology evolution (Chapter 3).
2. LED technology evolved through multi-directional and interconnected paths. Some LED technological domains drove the core LED technology evolution over time, while others followed distinct development paths that eventually diverged from the main trajectory (Chapter 4).
3. Entry into a nascent technology-based market is more likely for firms with prior core technology capabilities. Related technological capabilities can instead reduce the likelihood of entry (Chapter 5).
4. A firm's complementary assets and core technological capabilities reinforce each other's association with the probability of the firm's entry into a nascent technology-based market (Chapter 5).
5. Technological trajectory analysis can be used to characterise the types of technological capabilities possessed by firms.
6. The importance of a new radical technology for the economy may not be immediately visible. It emerges from cumulative pathways of explorations in multiple directions and market applications.
7. The largest incumbent firms often play a key role in technological development and enter a nascent technology-based market earlier than other firms.
8. Since radical innovation often (re)combine different technologies, firms should monitor technology and patenting behaviour both upstream and downstream in the value chain.
9. Industrial and innovation policies must be forward-looking and should take into account that a long trial-and-error process may be needed for a radical technological innovation to spawn a viable market.
10. "Look for something, find something else, and realise that what you've found is more suited to your needs than what you thought you were looking for" (Lawrence Block).