CINeLDI

Centre for intelligent electricity distribution
- to empower the future Smart Grid

PhD: Why wait? Modeling the timing of EV charging station investments and the role of policy

Emil Dimanchev

Department of Electric Energy, NTNU, Norway

Challenge and objectives

- Fast charging availability in rural areas is insufficient

- The commonly used Net Present Value method for understanding the economics of charging investment does not capture the role of uncertainty

Significant results

- Investors' uncertainty about future EV demand can explain the relative lack of fast charging in rural areas

- Investments would take place faster if policy makers mitigate investors' risk exposure

- Long-term contracts are an effective way to reduce investors' risk and thus incentivize investment

Research tasks

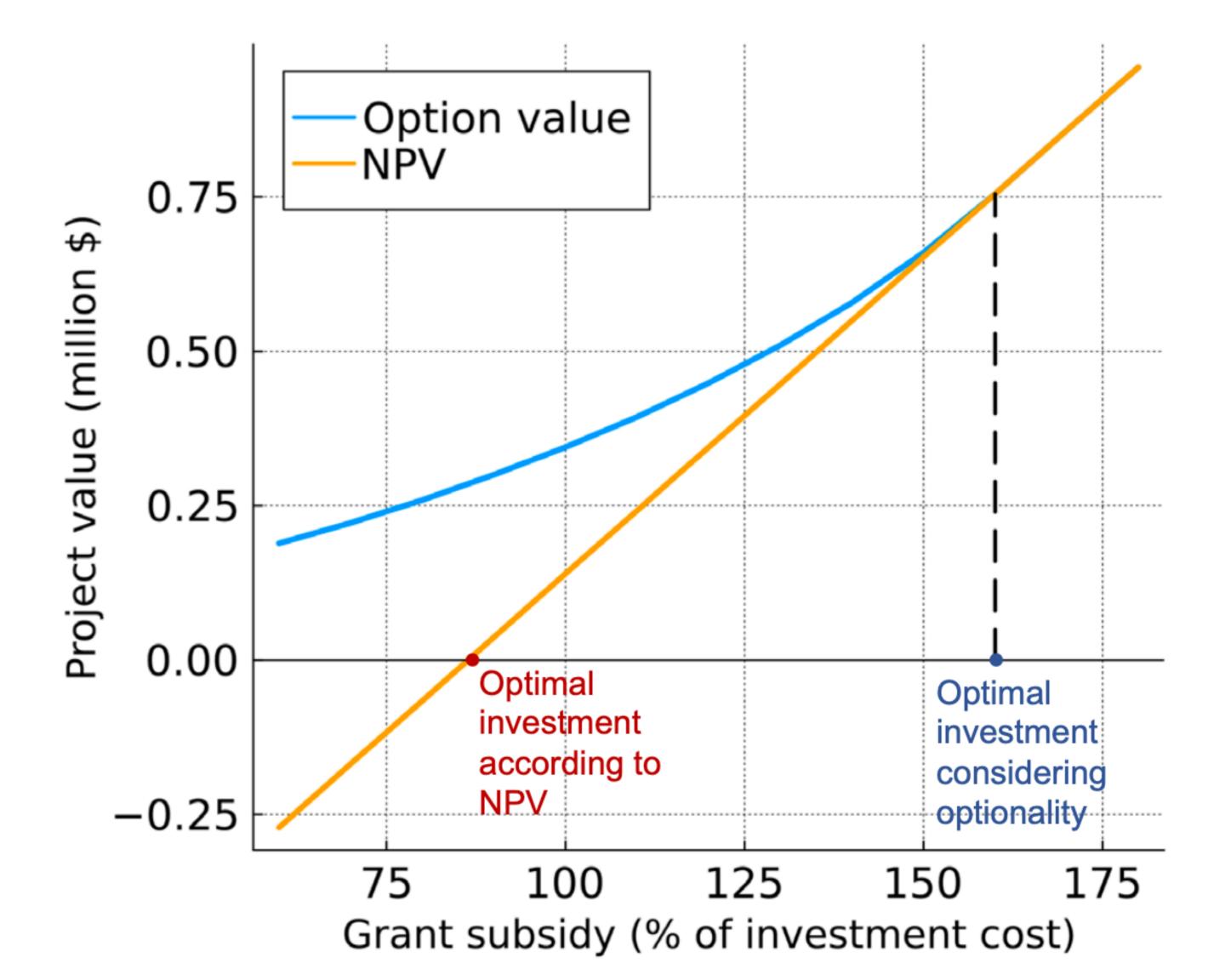- A model of investment that accounts for future uncertainty

Illustration

Approach

We model investment in charging stations under uncertainty using a real options approach

This allows us to capture the economic incentives driving investment decisions such as:

- The irreversibility of the investment

- The uncertainty in EV demand

- The option to delay investment