

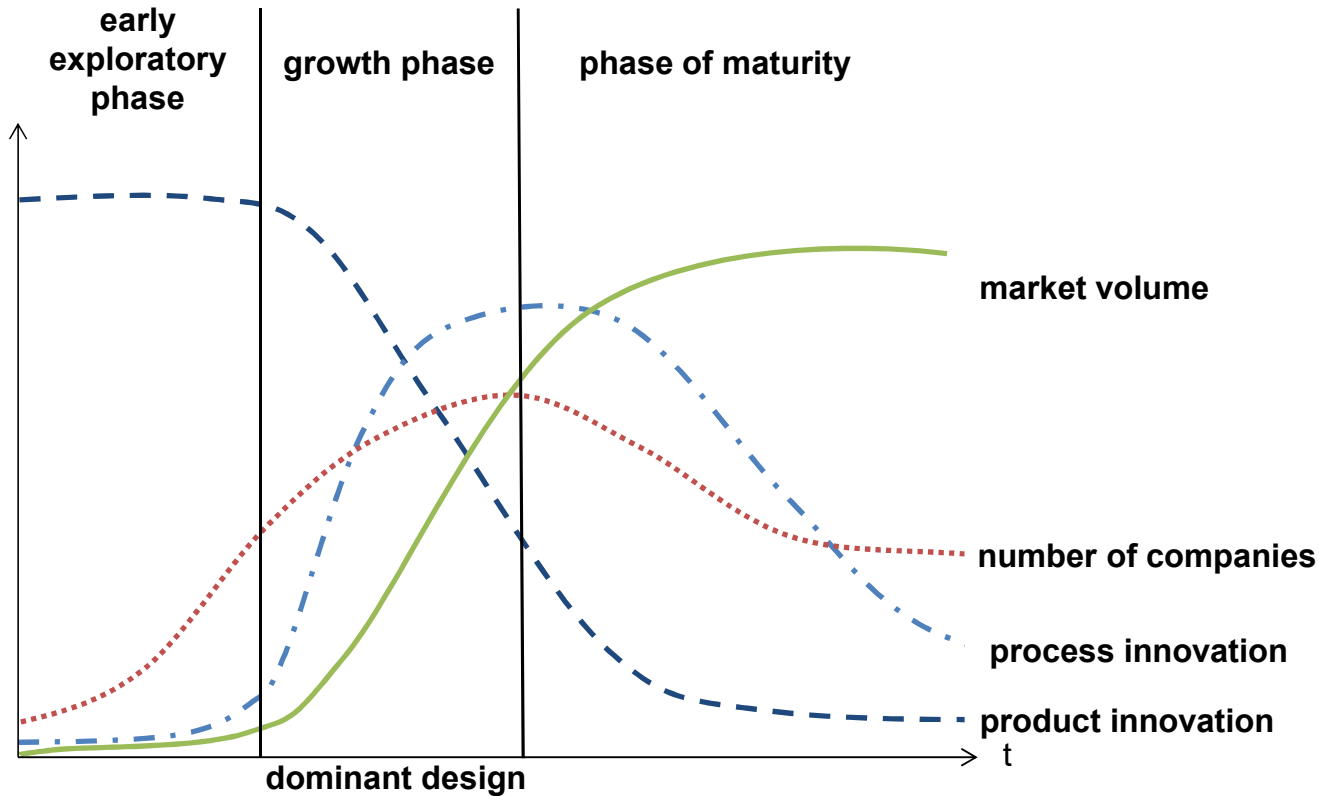
# The relevance of national markets for the development of new industries in the energy sector

Marlene O'Sullivan

A photograph of the Earth's horizon from space, showing the blue atmosphere, white clouds, and green and brown landmasses. The text 'Knowledge for Tomorrow' is overlaid on the right side of the image.

Knowledge for Tomorrow

## Industry life cycle (ILC)

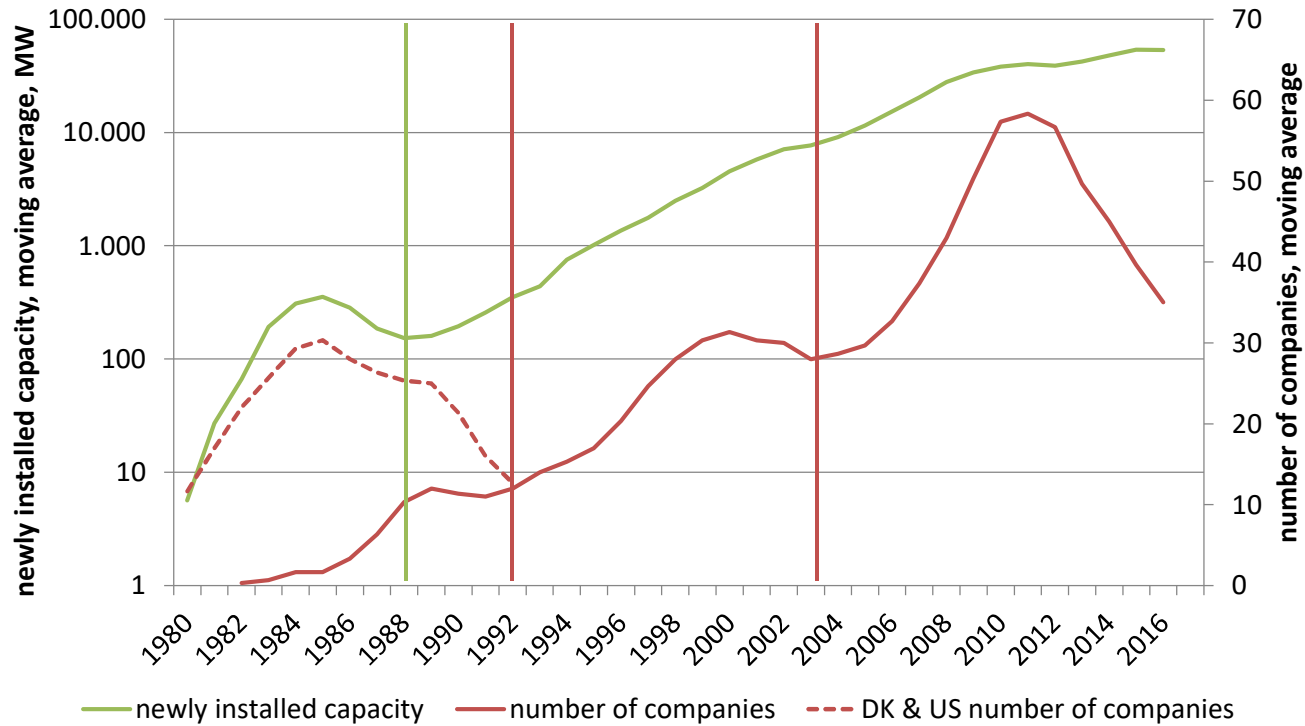


Source: O'Sullivan, M. 2020; based on Klepper 1997.

- Derived from the concept of product life cycles.
- Three phases are described in literature.
- Literature mostly addresses:
  - a. national ILCs for
  - b. industries that create demand for new goods and services.
- Question: Which market development has a larger relevance for the development of new industries in the energy sector – the national or global market?
- Analysis of wind onshore and solar cell industry.



## Global onshore wind industry development

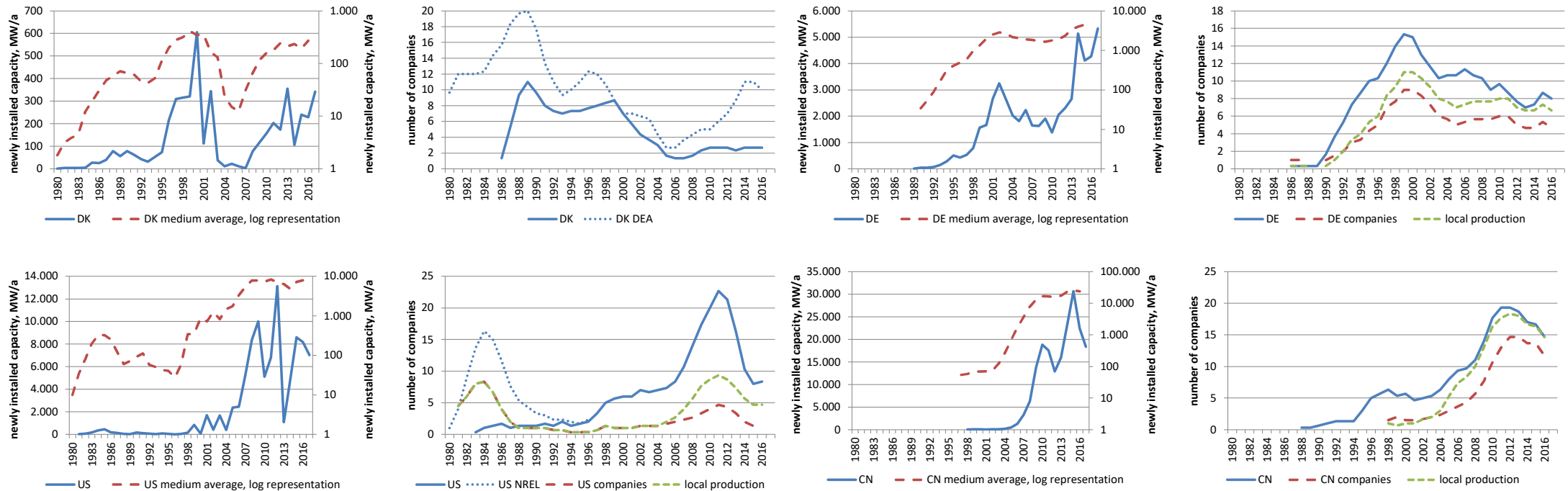


- Data on newly installed capacity gathered from national and international sources.
- Data on number of companies derived from a global wind farm database.
- Global market data indicates two cycles
- Number of companies leaves the impression of three ILCs.

own representation based on data from GWEC 2018, EPI 2018, Danish Energy Agency 2017, The Wind Power 2018, Jaeger 2013, Berkley LAB 2017



# National onshore wind industry development



Source: O'Sullivan, M. 2020.

- Analysis of 12 national developments
- Data is analyzed using descriptive statistical methods



## Findings of the analysis of the global wind industry life cycle (O'Sullivan 2020)

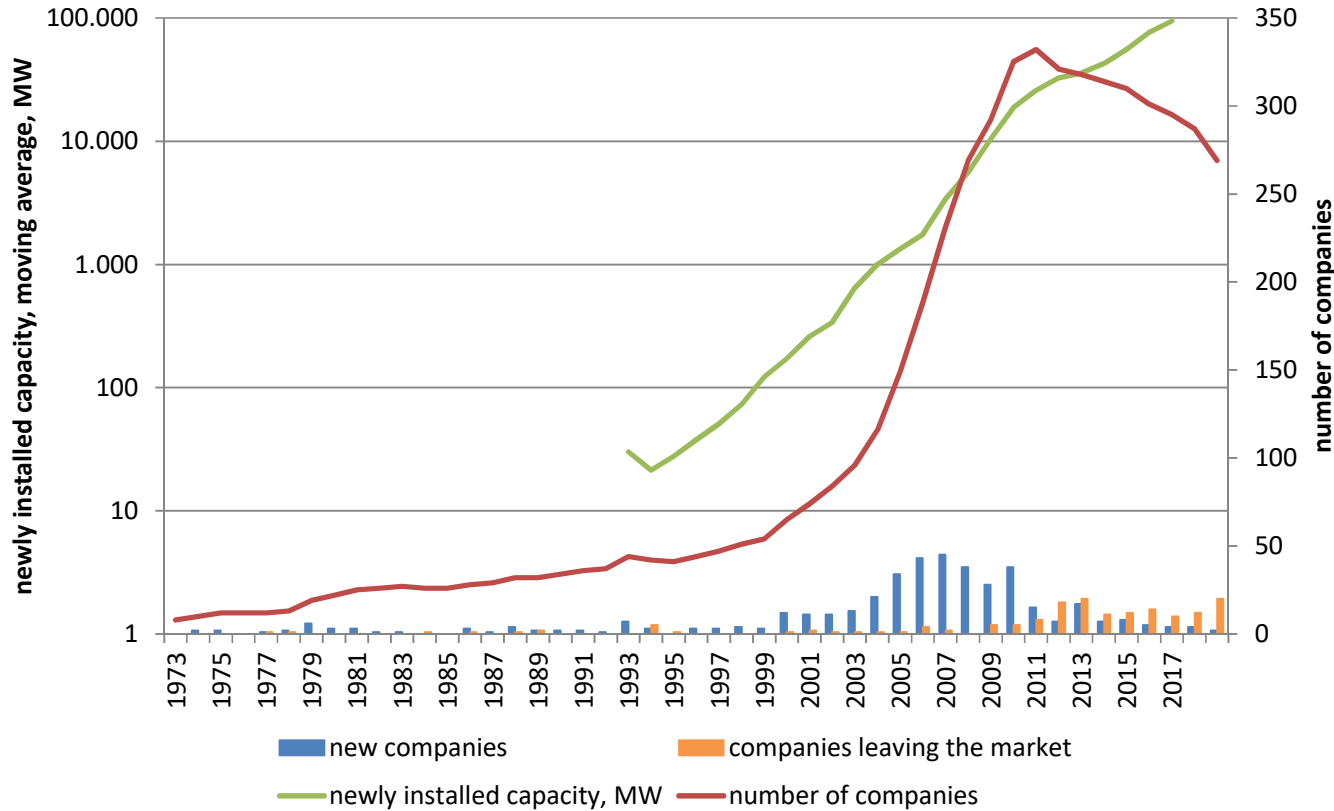
- Evolution of the global wind industry is characterized by a number of national industry developments.
- Political support systems had a large influence on national ILCs:
  - In the case of stable market conditions, national developments follow the ILC-model as described by Klepper.
  - Unstable national market developments led to an early shake-out of national based companies.
  - National industry development could be observed once.
- Competition on national wind markets (HHI):
  - A more competitive market can be found in countries with no national industry.
  - National industry development resulted in a dominant role of a few companies.



Hypothesis: National market developments have had a strong influence on industries in the renewable energy sector.



# Global solar cell industry development



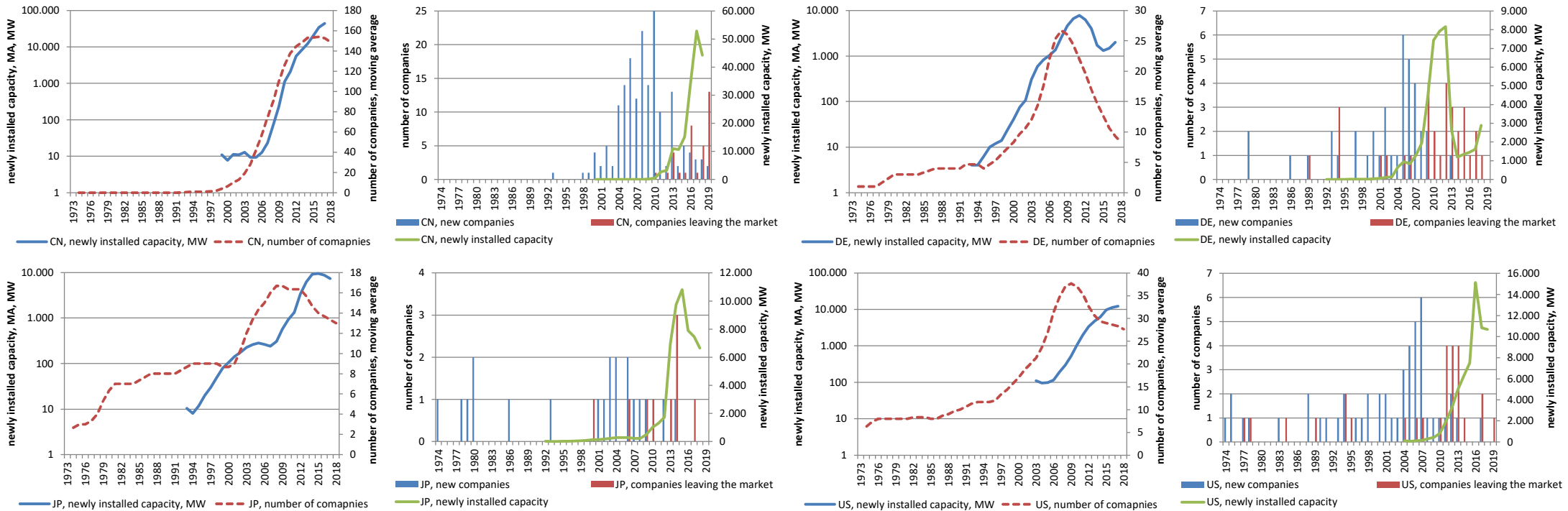
own representation based on data from IEA-PVPS 2020, own data collection

- Data on newly installed capacity used from IEA-PVPS, no data available before 1992.
- Data on number of companies derived via desktop research. Main sources: Jäger-Waldau 2021, IEA-PVPS 2021, ENF Solar 2021, company websites.
- The global development of the companies that produce solar cells follows the original ILC theory.





# National solar cell industry development



- Analysis of nine national developments
- Statistical analysis limited due to low data availability on national market developments



## Findings of the analysis of the global solar cell industry life cycle

- Overall, the global development of the companies that produce solar cells follows the original ILC theory.
- Since 2011 the number of companies active on the global market has been decreasing as global market growth slows down.
- The statistical analysis of the national market dynamics does not show the same explanatory value for the development of the national market participants as the global market evolution.
- The only country where national market developments show slightly better results in explaining the growth phase of its industry is Germany.
- In China the statistical explanatory value of the national market is almost equal to the global market development.
- Even though the ILC suggests that the global solar cell industry is in the phase of maturity there are still new companies founded that pick up on the latest developments in cell technology.





## Conclusions and further research

- The hypothesis that national market developments have a strong influence on renewable energy industries does not hold true at all levels.
- The wind and solar cell industry have in common that the creation of a national demand has been a driver for the creation of companies in a country.
- In the case of wind turbine manufacturers, the domestic market seems to play a decisive role in the survival of the companies.
- For solar cell manufacturers, however, the development of the global market is of greater relevance.
- Further research is needed to understand why the role of national markets for these two technological sectors is different. One reason could be different investor structures, another different distribution structures and transport conditions.



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