



# Role of data and digitalisation policy mixes in the UK's smart and flexible electric-mobility

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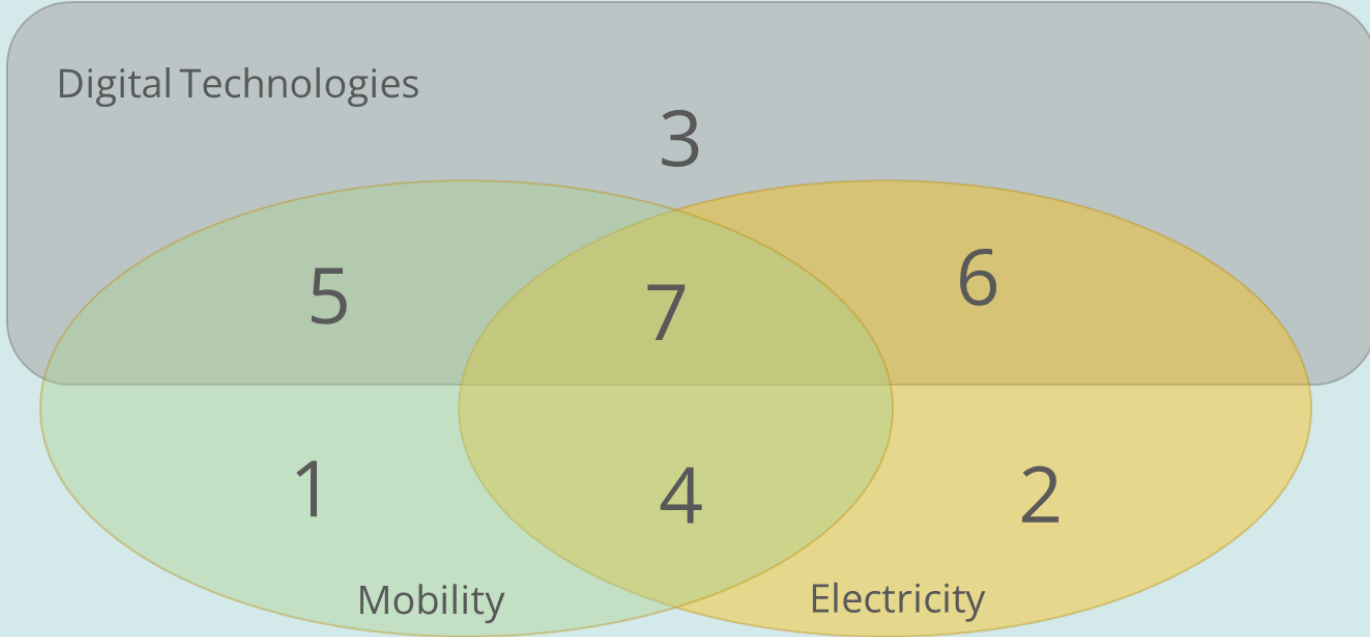
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Work-in-progress

# Introduction: Multi-system transitions

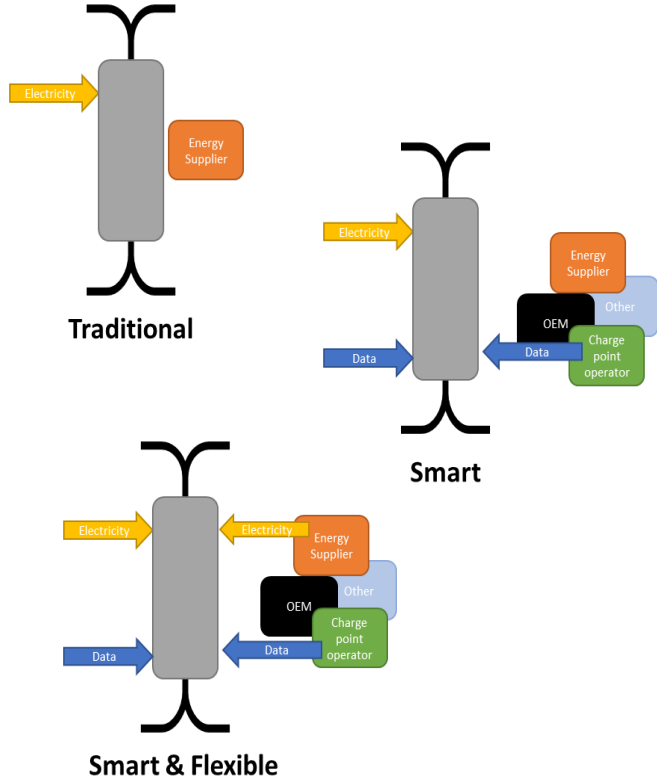


Interactions between energy and mobility systems (and with digital technologies)



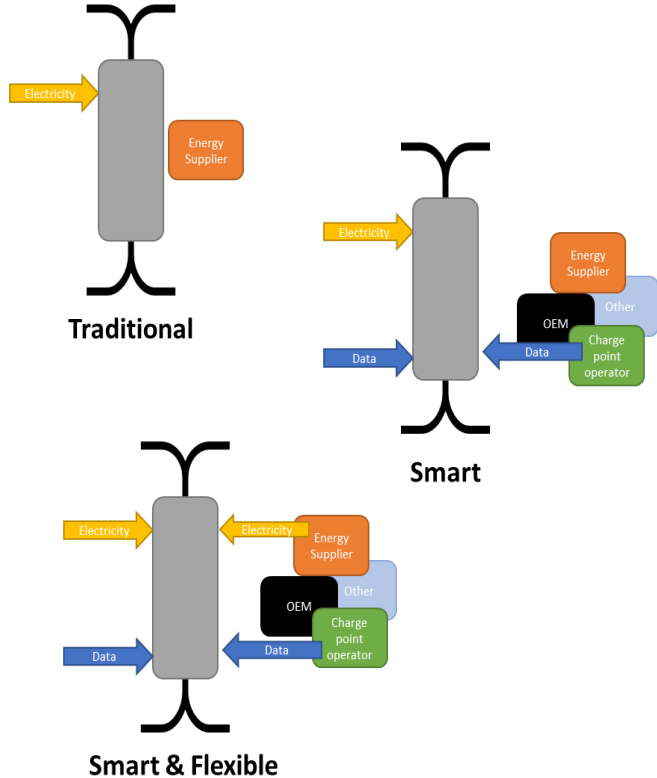
# Introduction: research case

Understanding the UK's **smart and flexible** energy-mobility trajectory



# Introduction: research case

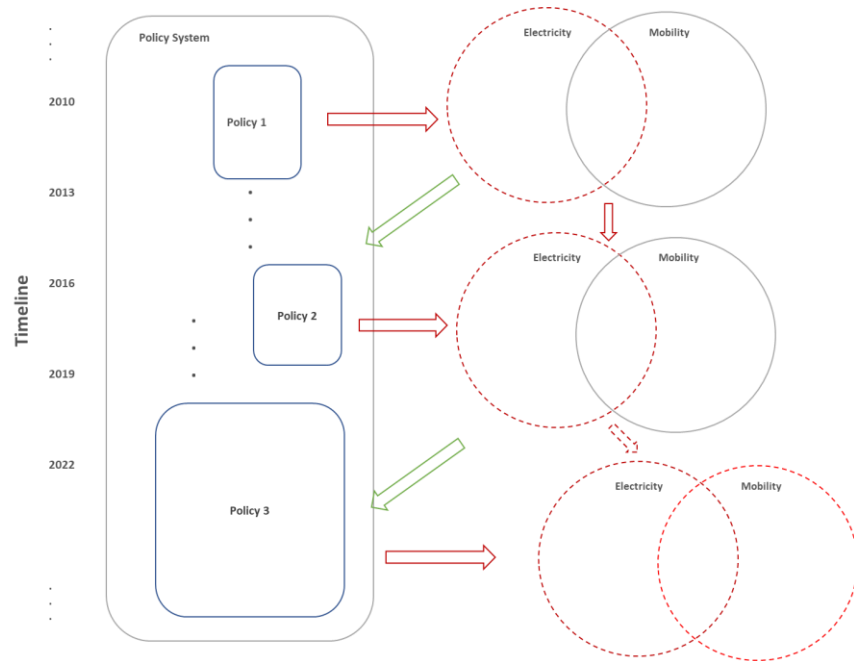
## Understanding the UK's **smart and flexible** energy-mobility trajectory



- 2021: The Electric Vehicles (Smart Charge Points) REGULATION
  - Mandating charge points to have smart feature and interoperability requirements
- 2023: Electric Vehicle Smart Charging ACTION PLAN
  - Aiming to take advantage of flexibility capacity EVs can bring
  - Facilitating integration of mobility into energy system
  - Supporting vehicle-to-everything (V2X) technologies
  - Data-driven charging business models
  - Supporting ongoing digitalisation efforts in energy system
    - Linkages with the smart meter and energy net programmes

# Concepts used in the analysis

## Drawing on Large Technical Systems and Policy Feedback Theory



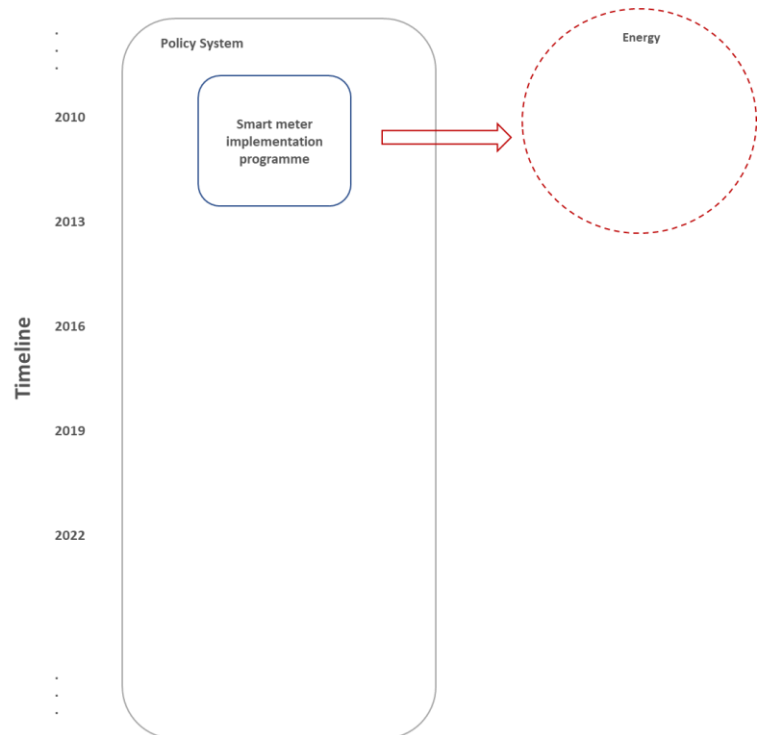
### ● System Building – Large Technical Systems

system building is about key individuals or organisations who control the necessary resources (concentrated agency) to solve critical problems and carefully steer the evolution of interconnected parts of a large technical system (Hughes, 1987)

### ● Resources and Feedbacks – Policy Feedback Theory

explains policymaking processes by examining the long-term interactions between politics and subsequent policymaking (Pierson, 1993)

# Analysis: Initial Results –1



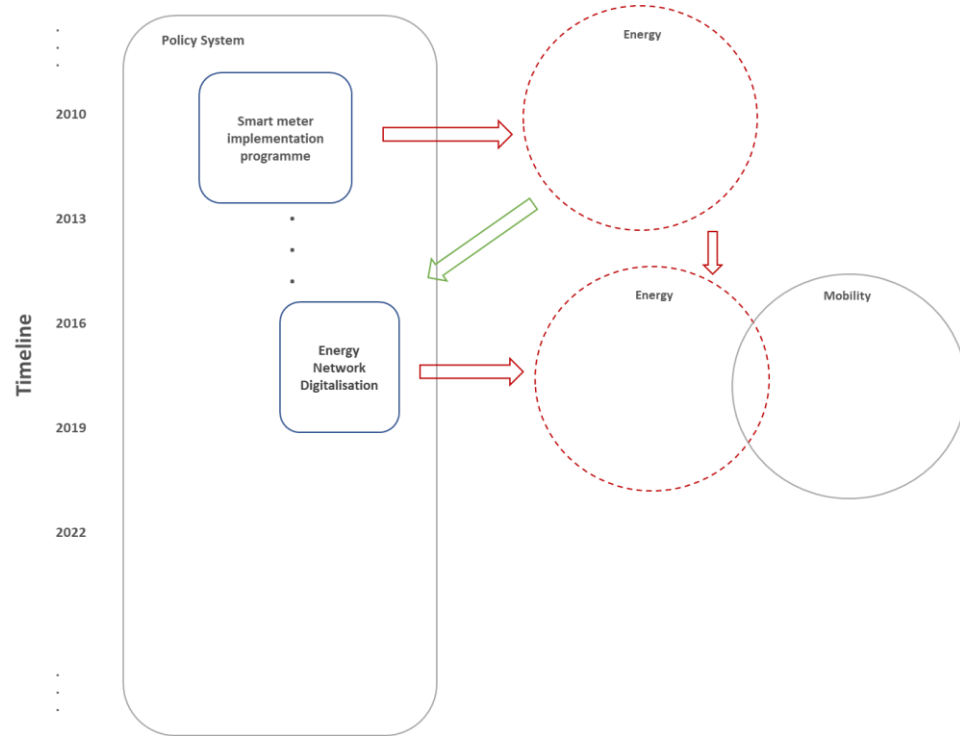
## Smart Meter Implementation Programme (2010 – ongoing)

- **Main actors involved:** Ofgem, Department for Business, Energy & Industrial Strategy, Smart DCC
- **Focus:** energy demand side digitalisation
- **Structure:** created a centralised data ecosystem between consumers and energy suppliers (and other DCC users)
- **Aim/Role:** contributing to energy efficiency; demand reduction
- **Issues:** technical, organisational and administrative
- **Delay on targets:** 2019, 2020, 2022, 2023, 2025...
- **Status:** adopted by almost half of the households
- **Technical infrastructure issues:** system users' and consumers' trust

# Analysis: Initial Results – 2

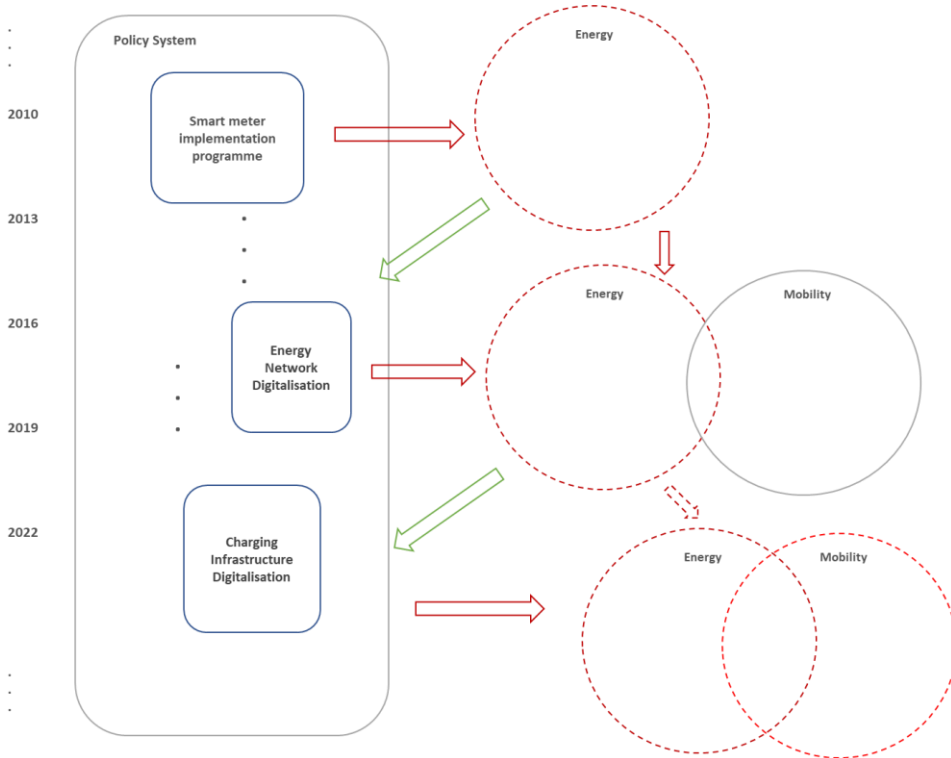
## Energy Network Digitalisation (2016 - ongoing)

- **Main actors involved:** Ofgem; Department for Business, Energy & Industrial Strategy; Energy Data Taskforce; Energy Digitalisation Taskforce; Energy Network Association
- **Focus:** energy supply side digitalisation
- **Mandates:** data sharing (data best practice) and digital strategy reporting
- **Structure:** Building data sharing mechanism b/w energy network operators and other parties (local governments, charge point providers, energy network actors) through decentralised infrastructures
- **Role:** Digitalisation efforts as set of solutions to enable transitioning to novel network governance
- **Issues:** Operational, potential bottleneck for rising renewables -> active network management
- **Discussion:** capacity of network actors, how open can they be?



# Analysis: Initial Results –3

## Charging Infrastructure Digitalisation (2019 – ongoing)



- **Main actors involved:** Ofgem, Department for Business, Energy & Industrial Strategy, Office for Zero Emission Vehicles
- **Focus:** charging infrastructure
- **Mandates:** smart features and interoperability
- **Structure:** Data sharing mechanisms between consumers and charging infrastructure providers (charge point providers, energy suppliers, OEMs, others...) through smart meter ecosystem and third-party providers
- **Role:** Mobility integration into energy system through V2X and digital tech
- **Discussion:** linking with smart meter ecosystem, and ongoing energy network digitalisation programme



# Discussion

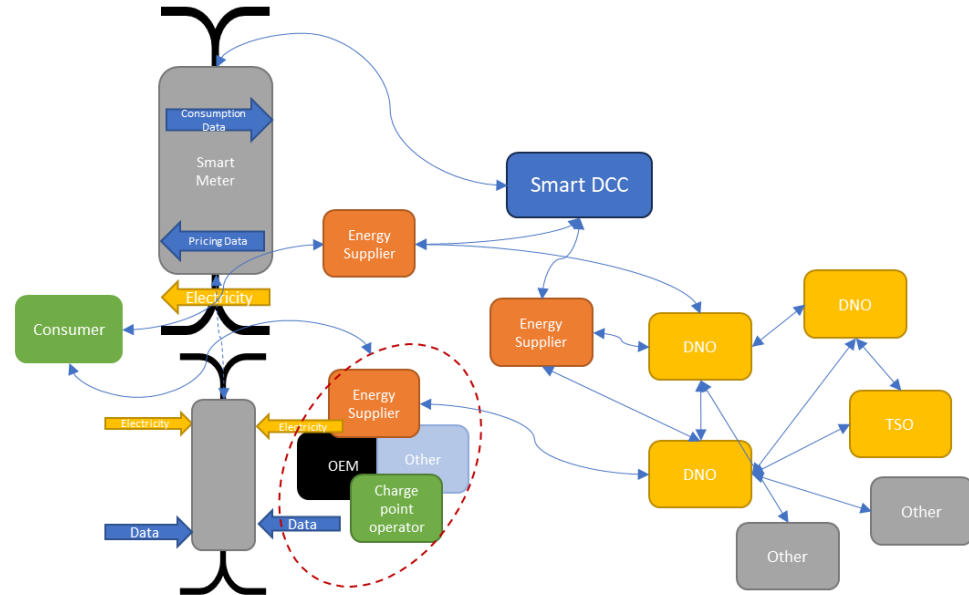
## Key insights and reflections

- **Focal sector:** energy (transport, heating, and gas to be integrated)
- **History:** Digitalisation efforts in energy started more than a decade ago
- **Definition issues:** understanding and the role of data digitalisation differs from one to another
  - Implications for divergent interpretive effects
- **Structural power imbalance in influencing energy-mobility integration decision making:**  
Due to possession/ lack of resources, or coalition endorsed (knowledge/ expertise), with information provided by existing actors on earlier structures
- **Multi-system exchanges:** transparent inter and cross-sectoral dialogues/ forums can support more informed and participatory approach for system(s) transition

# Discussion

## From silos to linking: policy making and linking challenges

- **Siloed policy making:** three areas of digitalisation mostly separated in policy making – expectation is they would interlink
- **Linking challenges:** with the current digital infrastructure being built in energy and mobility, linking these infrastructures has serious challenges
  - Limited or no data access – different governance structures
  - Capacity issues
  - Divergence in industry actors' interests



# Outlook

## Need for a new approach for data governance

- **Key requirements**
  - beyond data protection
  - enabling/ increasing consumer engagement
  - dealing with digital inclusion/ exclusion issues (just transition approach)
  - enabling entrance of new actors to accelerate smart and flexible system trajectory

# Outlook

## Need for a new approach for data governance

- **Key requirements**
  - beyond data protection
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  - dealing with digital inclusion/ exclusion issues (just transition approach)
  - enabling entrance of new actors to accelerate smart and flexible system trajectory
- **Alternative approaches to data governance**
  - a holistic/ systemic approach? maybe a multi-system approach?
  - data spaces in the EU: consumers to control and share their data (including in-vehicle data)
  - redistributive approaches

Thank you!

Any questions?

More information

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# Large Technical Systems (1)

## Concepts: Reverse Salients, and System Building

### Evolution of large technical systems

- invention, expansion, growth, momentum, and technological styles

### Reverse salients

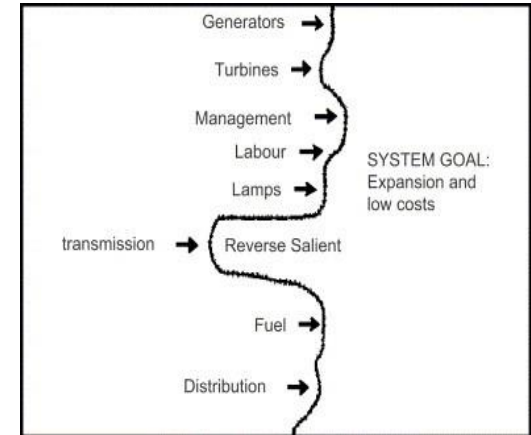
*"...the concept of a reverse salient refers to an extremely complex situation in which individuals, groups, material forces, historical influences, and other factors have idiosyncratic, causal roles, and in which accidents as well as trends play a part." (Hughes, 1987, p. 79).*

### System building

*"... system building was a game of many actors and, consequently, full of negotiation and conflict, producing winners as well as losers." (Van der Vleuten et al., 2007, p.328)*

- 1870s: Inventor system builders inventors - Thomas Edison
- the Interwar years: Manager-entrepreneurs Henry Ford
- after second world war: Military-university-industrial (Manhattan Project, ATLAS project)
- 1970s: open system building - interest organizations to have a say in decision-making (Hughes 1983; Van der Vleuten 2006)

*Following these ideas, system building is about key individuals who **control** the necessary resources (concentrated agency) to solve critical problems and carefully steer the evolution of interconnected parts of a large technical system.*



Source: Hughes, 1992, p. 99

# Policy feedback theory (2)

Policy feedback theory explains **policymaking processes** by examining the long-term interactions between politics and subsequent policymaking. (Pierson, 1993)

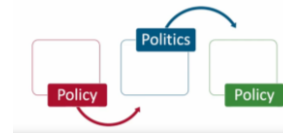
## - Effects

- Resource: means and incentives
- Interpretive : cognitive

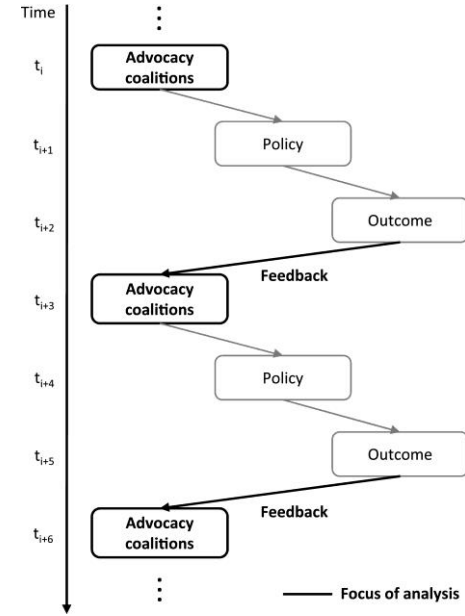
## - Feedbacks – policy inquiry types

- Meaning of citizenship
- Form of governance
- Power of groups
- Political agendas and the definition of problems

- Transition studies – (Edmonson et al., 2019, Lockwood, 2022)



Source: Sacks, 2020



Source: Schmid et al., 2020