SUSTAINABLE ENERGY AUTHORITY OF IRELAND

Declan Meally
Head of Department – Emerging Sectors

www.seai.ie

Overview

- The Emissions Challenge
- Growth and Technology Developments
- The Supports available
- The Public Engagement Programme

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The emissions challenge

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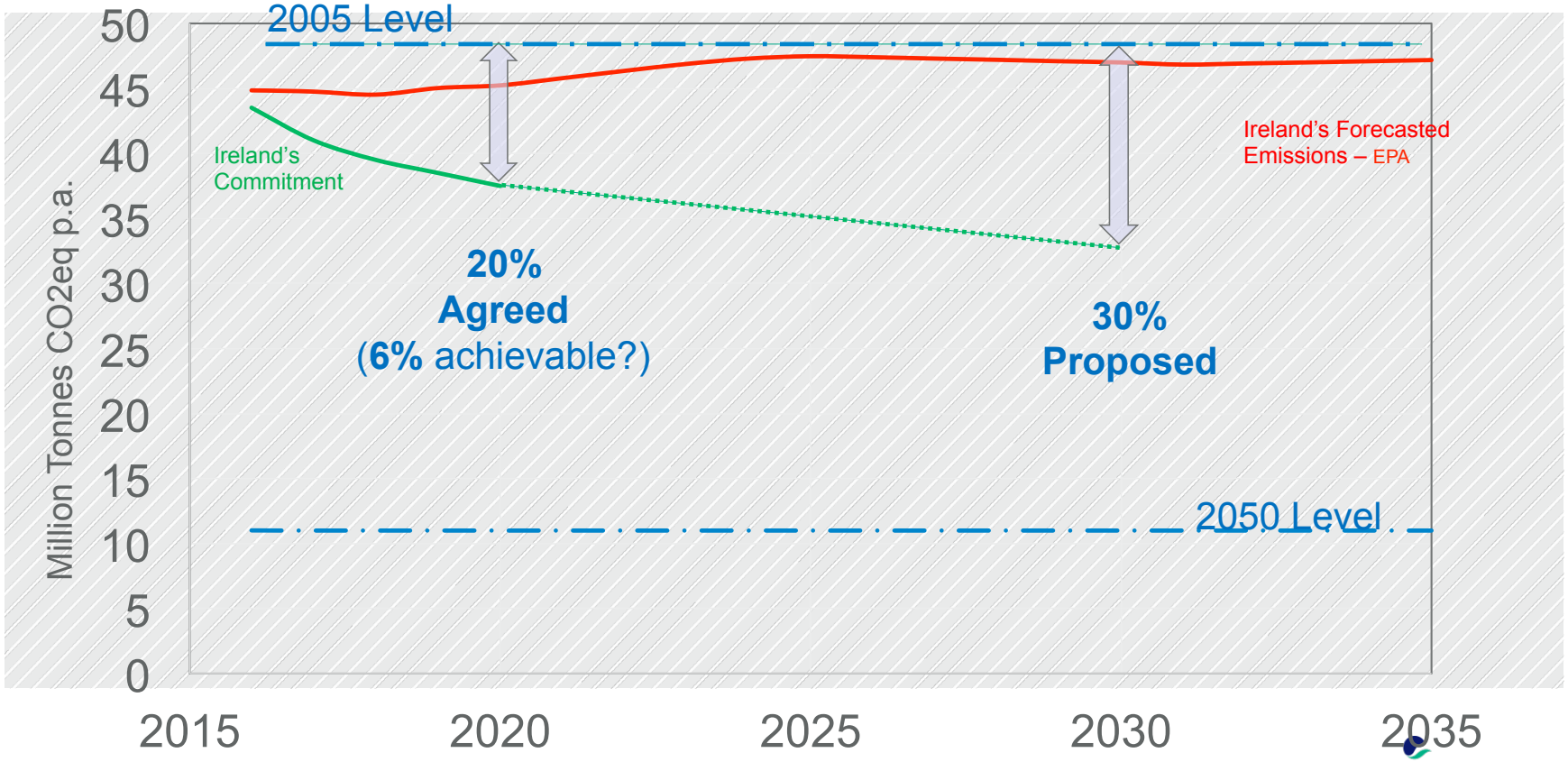
Ireland's Greenhouse Gas (e.g. CO2) Emissions (Non-Traded) – A Big Problem…



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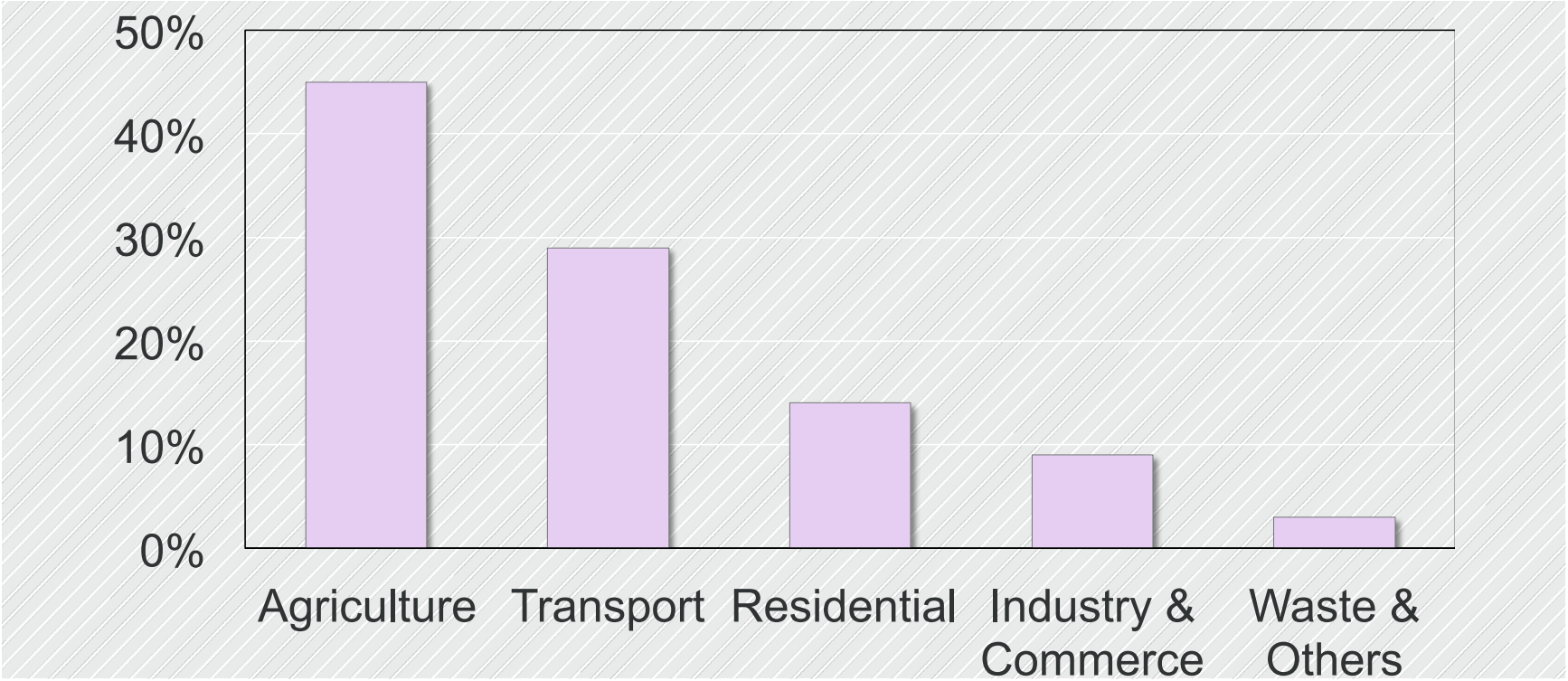
Ireland's Emissions 2020 (Non-Traded)



Source: EPA, Scenario With Additional Measures, April 2017

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Two Major Policies Set to Dominate

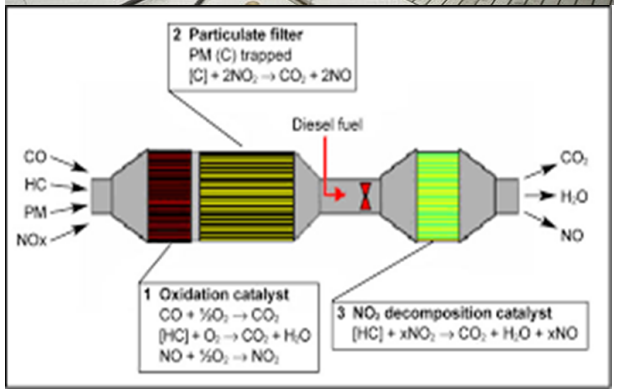
- **Alternative Fuels Infrastruct Direct**
  - Minimum coverage across Ireland by 2025 of Alternative Fuelling Infrastructure:
    - Electric Vehicles
    - CNG and LNG
  - Common Standards across EU
  - Consumer Information
- **Fuel Quality Directive Amendment**
  - Transport Fuel Suppliers must reduce GHG content by 6% by 2020 wrt 2010
  - Any combination which delivers lower GHG – RE, Natural Gas, H2 etc

Reaction in Europe

- Many blame Diesel for rising **Smog**/Air Quality problems
- Cities begin **banning Diesel cars – Paris, Madrid e.g.**
- **Health issues** recognised
- Several Countries have already adopt **Zero Emission Vehicle** policies in 2025 to 2035 time frame

Green House Gas v Toxic Emissions

- **Passenger Cars**
  - **New test cycle WLTP &**
  - **Real World Driving Emissions**
  - CO2 - regulated at EU Level
  - Toxics - Euro Standard
- **Heavy Goods Vehicles**
  - CO2 - CO2 regulations ??
  - Toxics – Euro Standard g/kWh of energy
- **ICEs deteriorate in service** – consideration of standards here?



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2018 – The market changes

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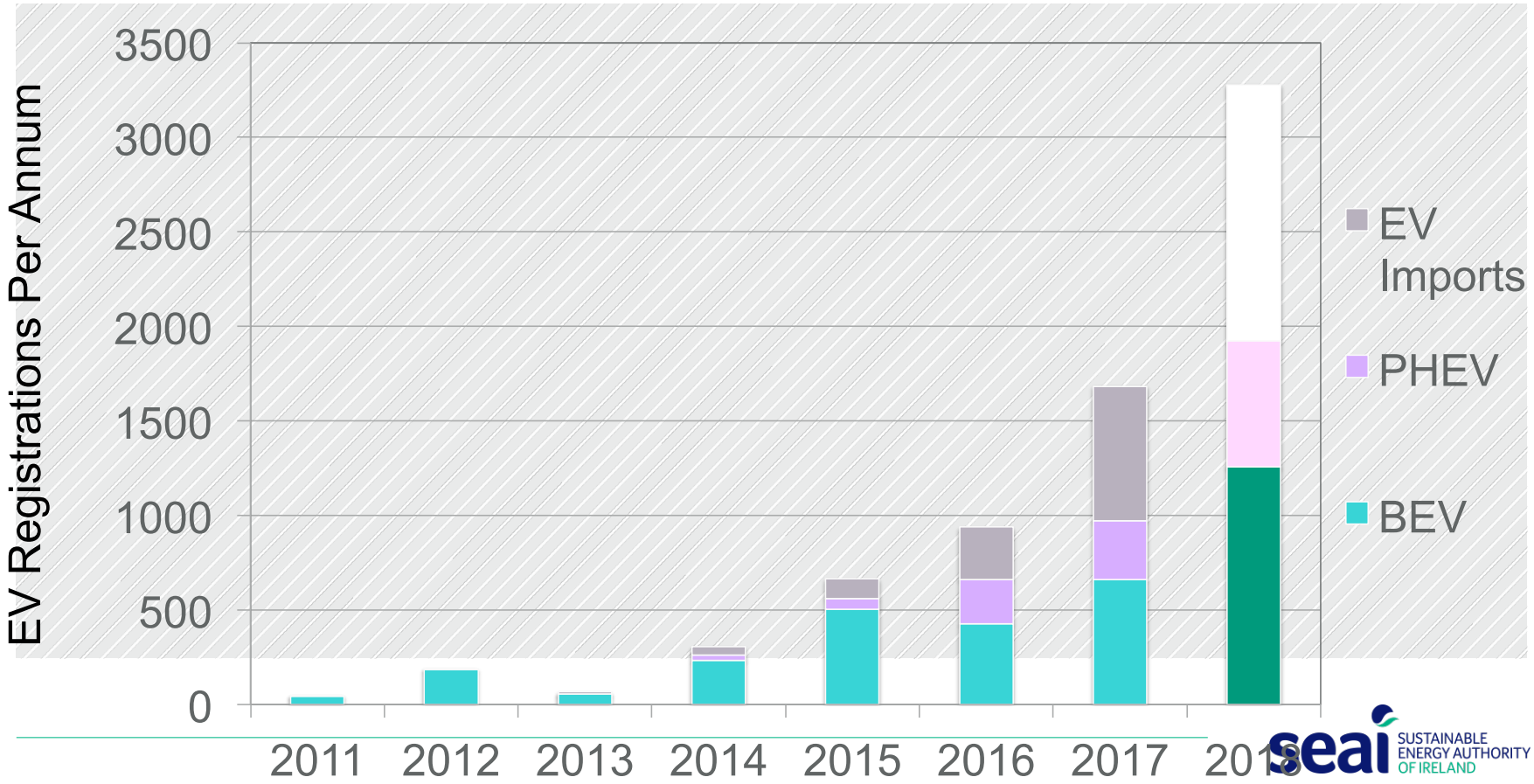
EV Registrations in Ireland (EV stock on Irish roads now 7,176 cars)



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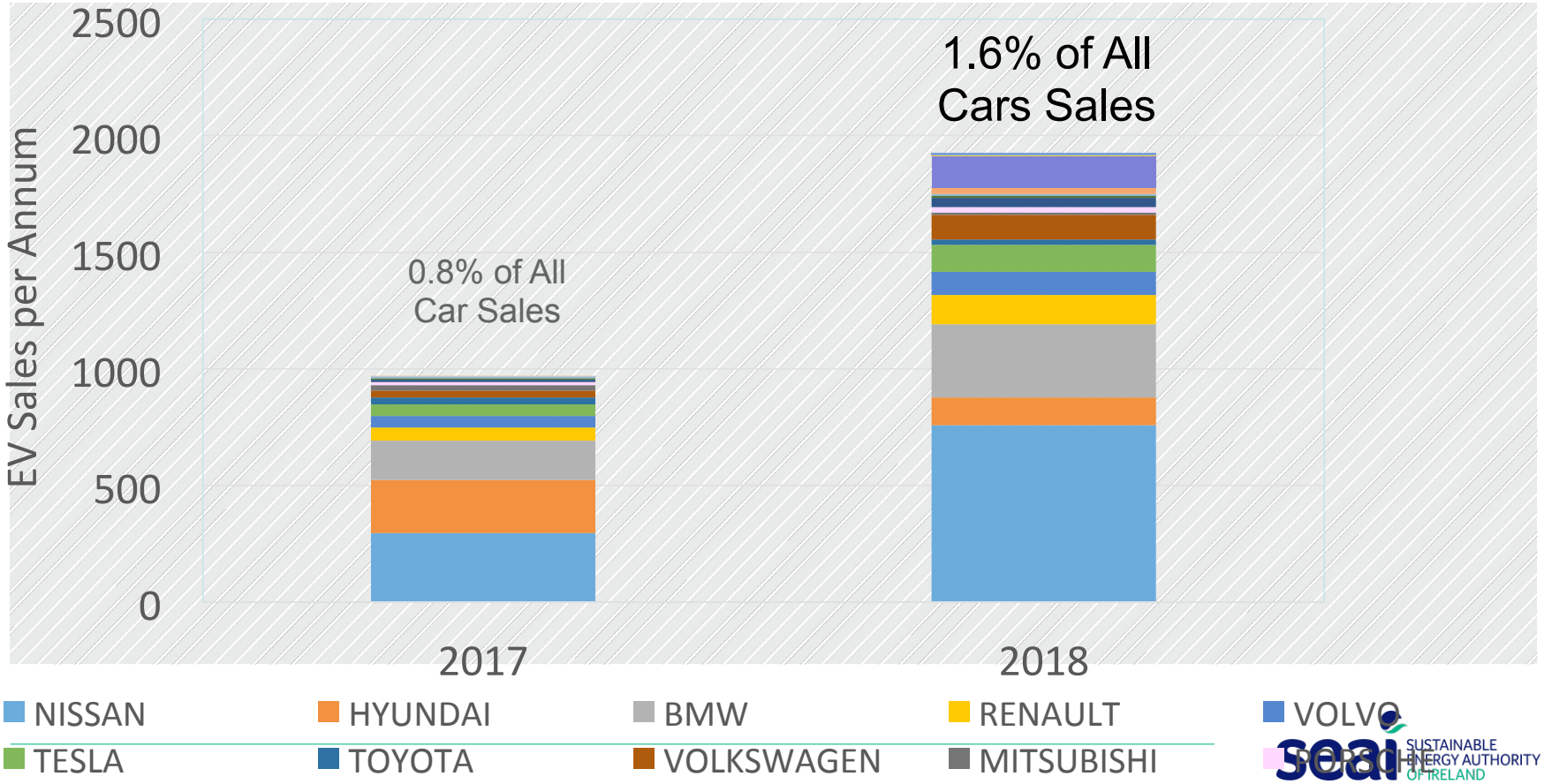
EV New Car Sales in Ireland by Manufacturer



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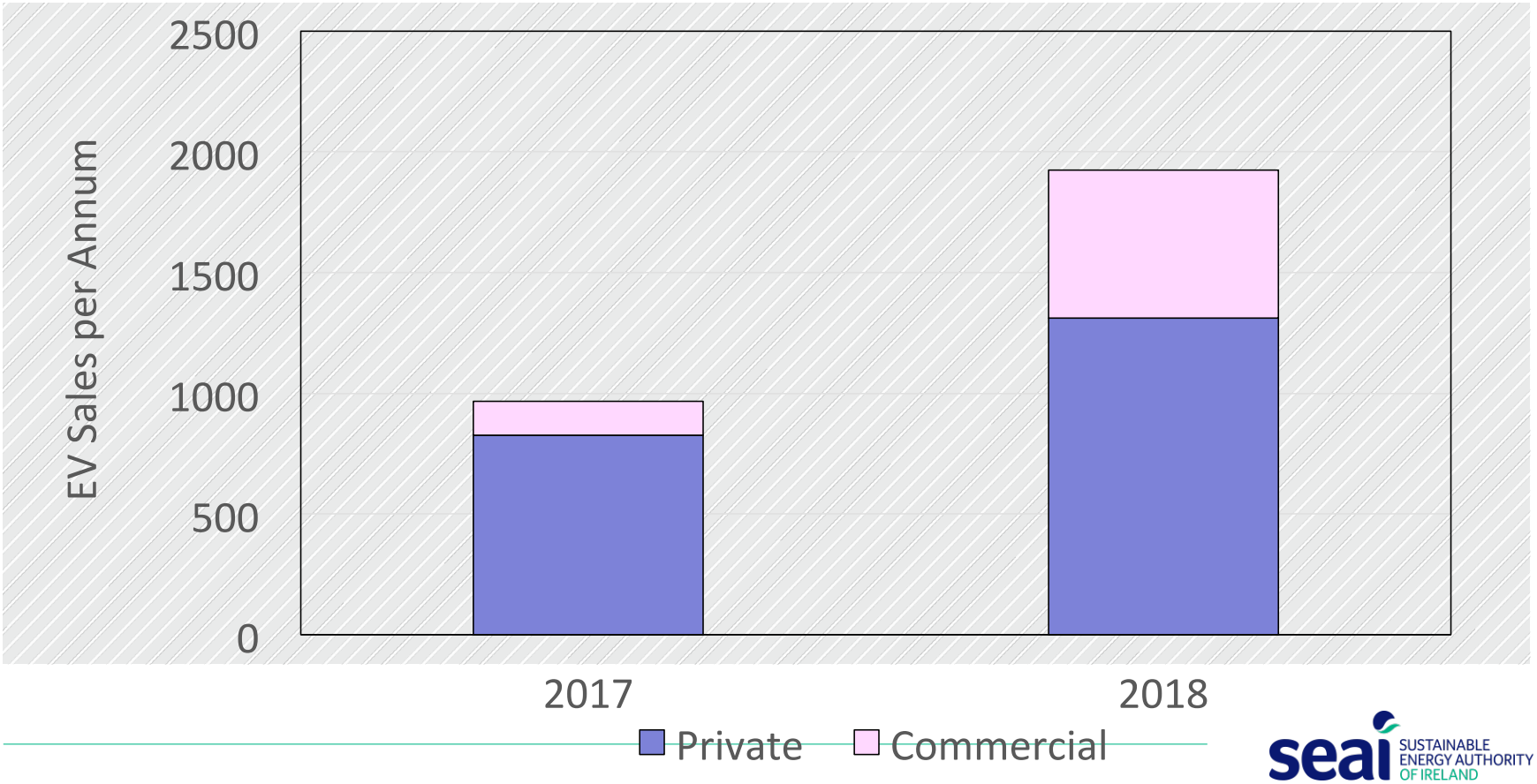
Effect of new policy measures - BIK and Tolls



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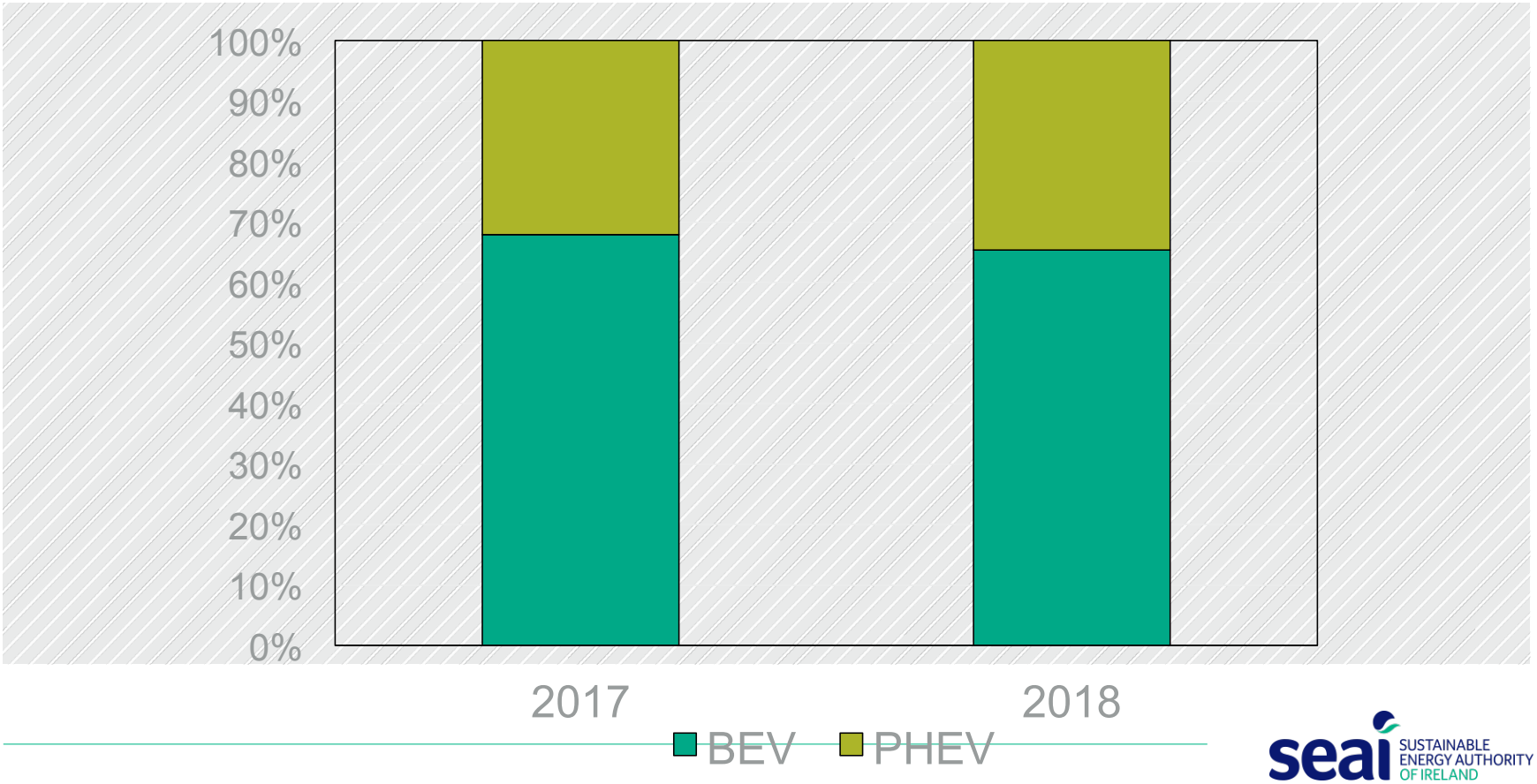
% BEV vs PHEV – New Sales



Vehicle and Charging Infrastructure Developments

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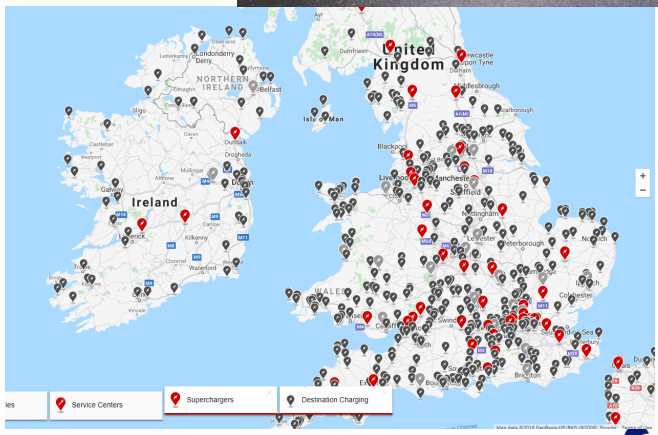
Infrastructure

- **Ownership of Public Network passing to ESB Networks**
  - Replacement of Fast Chargers w 3 headed units plus some new fast chargers
  - Replacement of Street Chargers w more reliable units
- **Councils Trialling Street Lamp Chargers**
- **Climate Action Fund (50mEuro)**
  - Open to Fast Charger applications
- **Tesla Private Network**
  - 4 locations x 8 chargers x 120kW
- **Ionity Private Network**
  - ? Locations x 6 charger x 150kW



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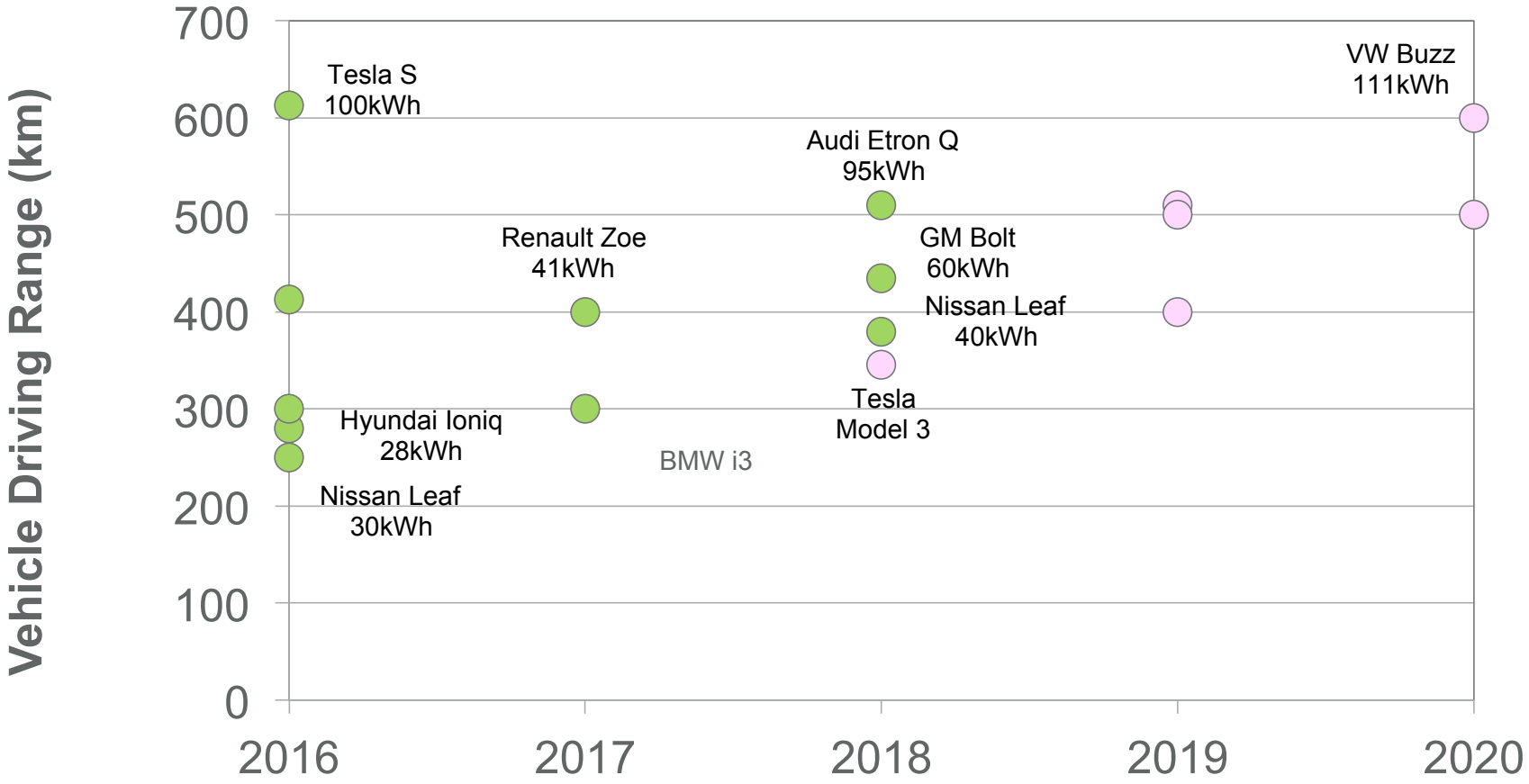
Batteries Steadily Growing in Size



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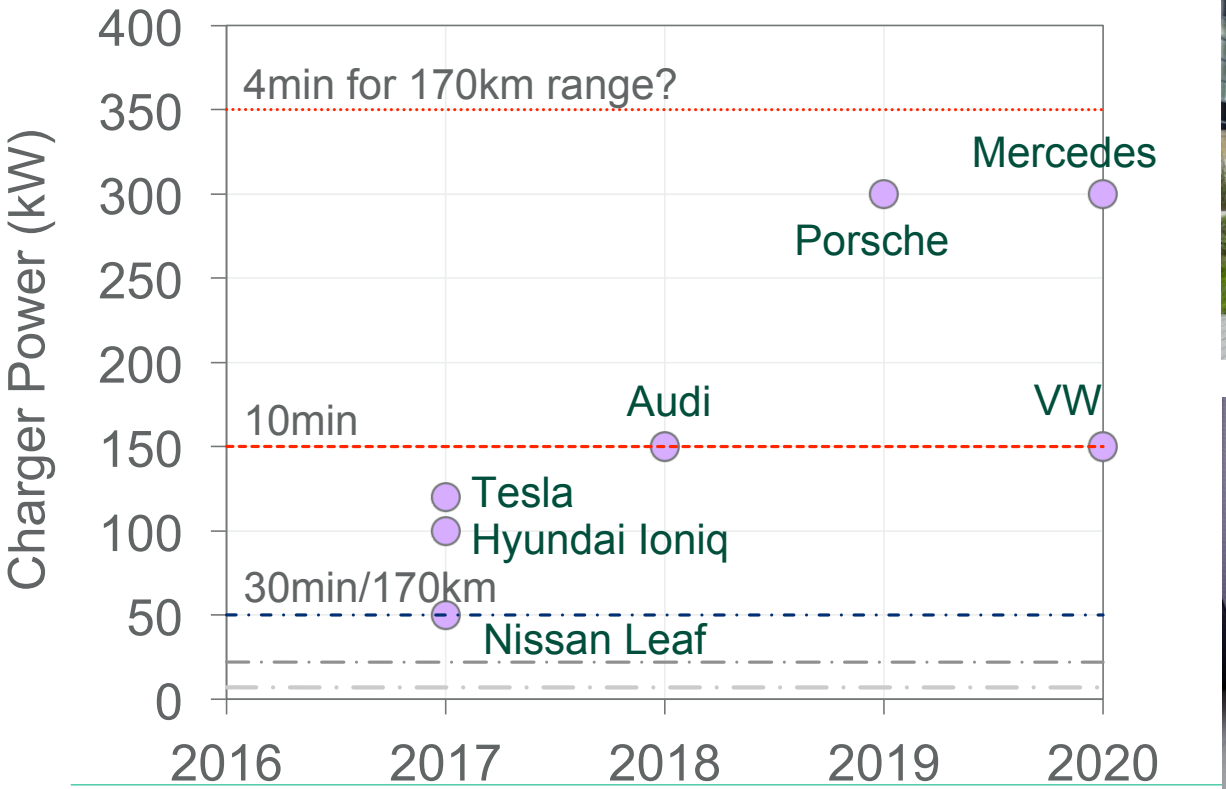
How Fast Will Cars be Charged?



2018 – The supports available

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SEAI EV Grant Scheme

- **Grants to purchase**
  - Battery Electric Vehicles
  - Plugin Hybrid Electric Vehicles
- **5,000euro grant to Dealers**
  - plus 5,000euro VRT relief also
- Domestic Homecharger Grants - €600
  - New and second hand
- **Funding 2000+ EVs in 2018**
  - +150 Dealers registered
  - +30 models from 11 separate Manufacturers eligible

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Additional EV Supports

Non-SEAI Measures

- Taxi Grants (+7kEuro (NTA))
- Tolls (€500 discounts for EVs)
- Benefit In Kind relief for BEVs only
- No BIK on electricity used for transport

2018 - Public Engagement

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Public Engagement

- Partnership – SEAI lead – DCCAE, LEV TF, SIMI, Dealers
- www.drivingelectric.ie
- The “First” Stop Shop
- Myth Busting
- Book a test drive – EV
- Car Comparator
- The Campaign
  - The New Faces of Driving Electric

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SEAI Behavioural Economics Team

Randomised Controlled Trial

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Cost Comparison Tools – A Solution?

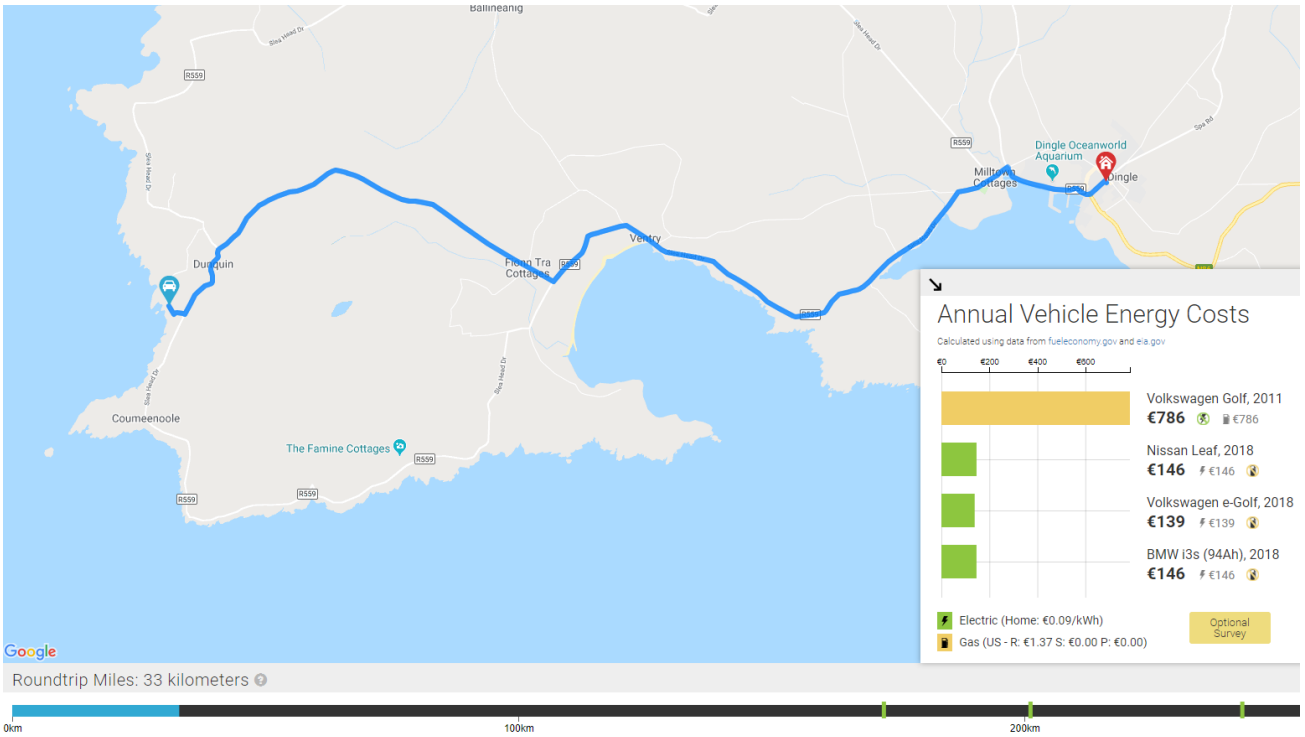
- Typically include information on:
  - Upfront and energy costs
  - Range capabilities
  - Charging infrastructure
  - Grant availability
  - Emissions
  - Tax

Comparison Results

CAR	VOLKSWAGEN Golf Diesel	NISSAN 40 kWh Leaf (MY 2018) Battery Electric	BMW i3 (Jul 2016) Battery Electric
ENERGY COST	€847	€297	€181
MOTOR TAX	€190	€120	€120
CO2 EMISSIONS	1.74 tonnes CO_2	1.59 tonnes CO_2	0.97 tonnes CO_2
ELECTRIC RANGE	Not Applicable	378 km	312 km

EV Explorer

- Visually salient personalised information.
- Journey specific information computes annual energy costs for the user.
- Also indicates range capabilities.



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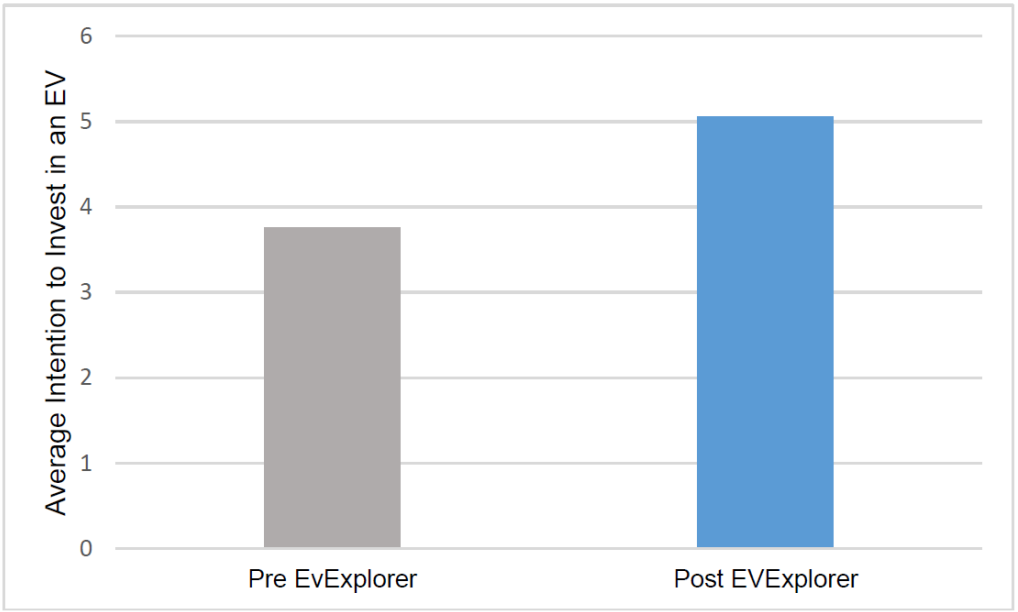
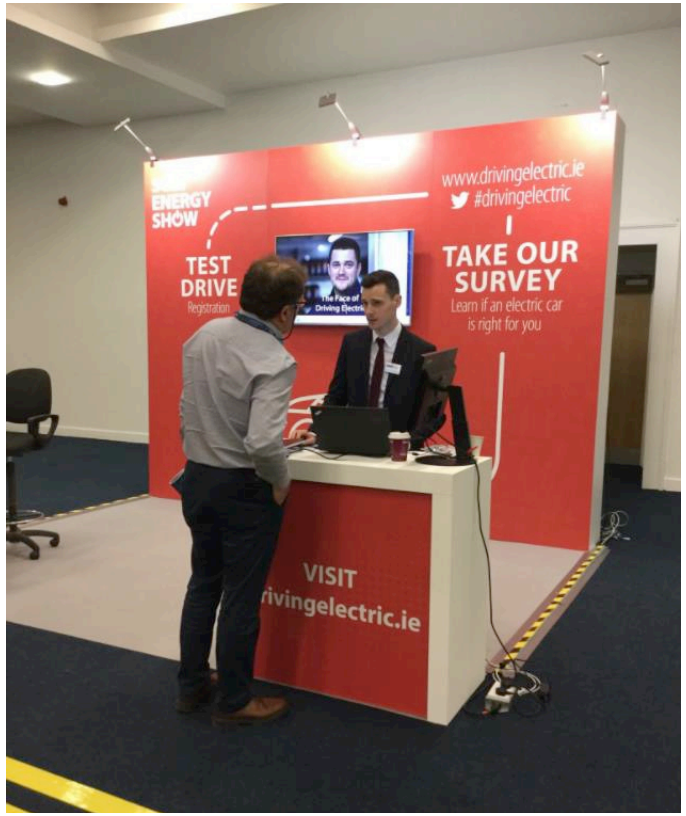
Proof of Concept

- Energy Show & Ideal Home Show
- Simple before/after design
- Intention to invest before and after viewing output from EV Explorer.





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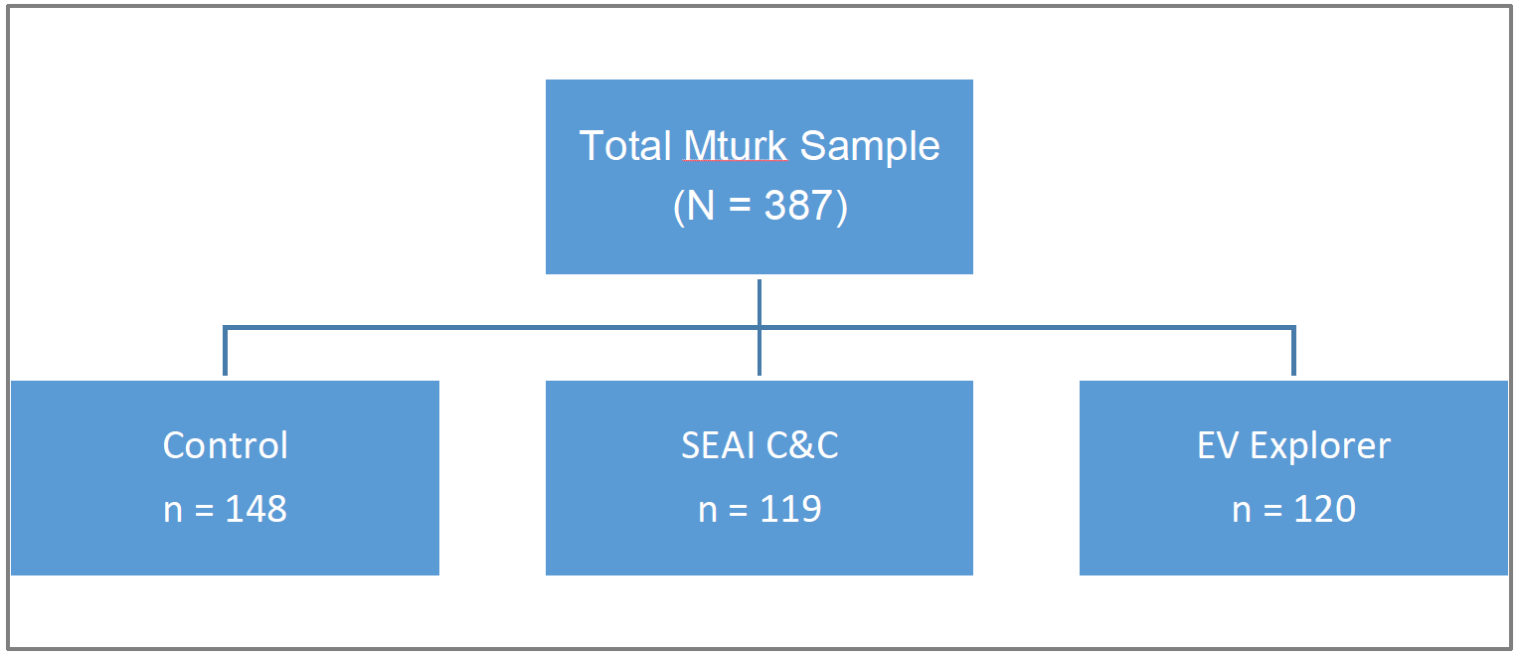
Randomised Controlled Trial

- Sample recruited via Amazon Mechanical Turk
- Three-armed RCT



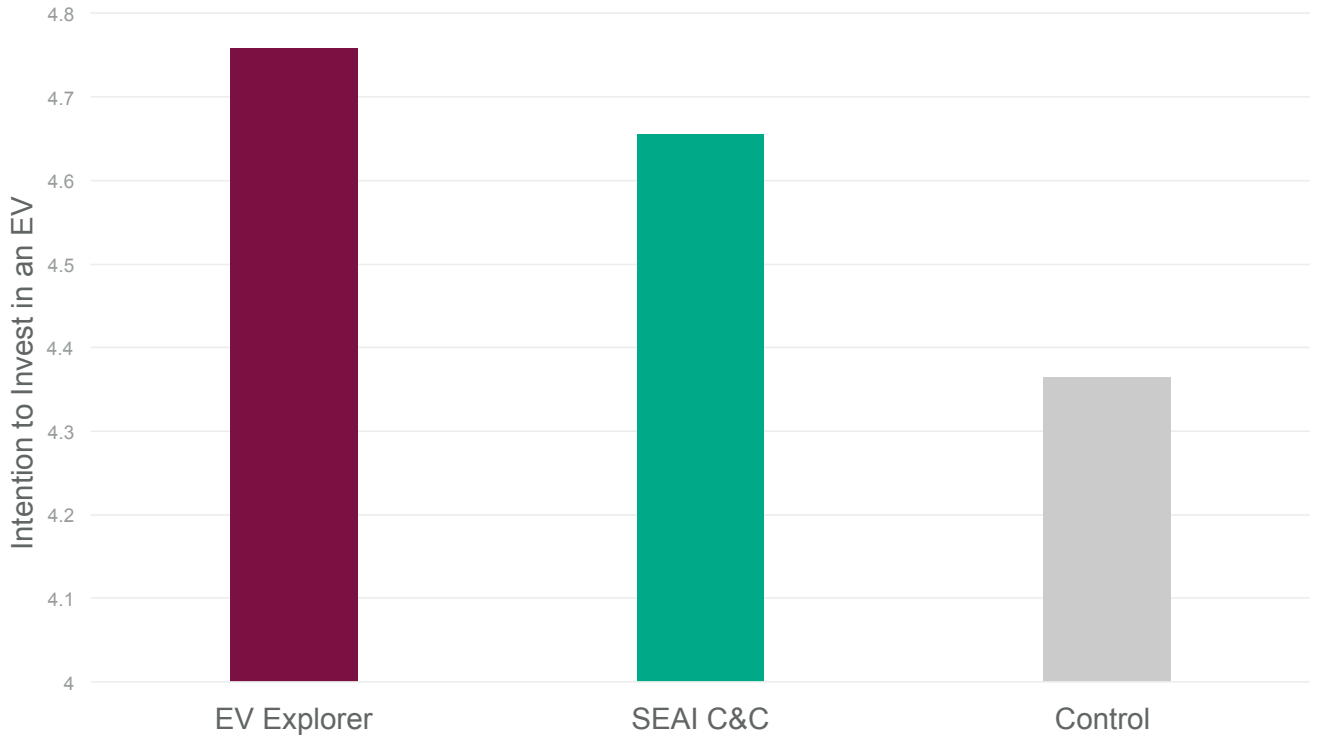
Post Comparison Tool Questions

- Intention to invest
  - *When you are purchasing your next vehicle, how likely is it that you will invest in a fully electric vehicle?*

- Extent to which energy costs would encourage future investment
  - *Would the running cost associated with a fully electric vehicle encourage or discourage you from purchasing one when you are purchasing your next vehicle?*

- Range anxiety
  - *I am more concerned about the range of an electric vehicle than I would be about a conventional vehicle with an internal combustion engine*
  - *While driving an electric vehicle, I would often be worried about range.*

Results – Intention to invest in an EV



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Intention to Invest

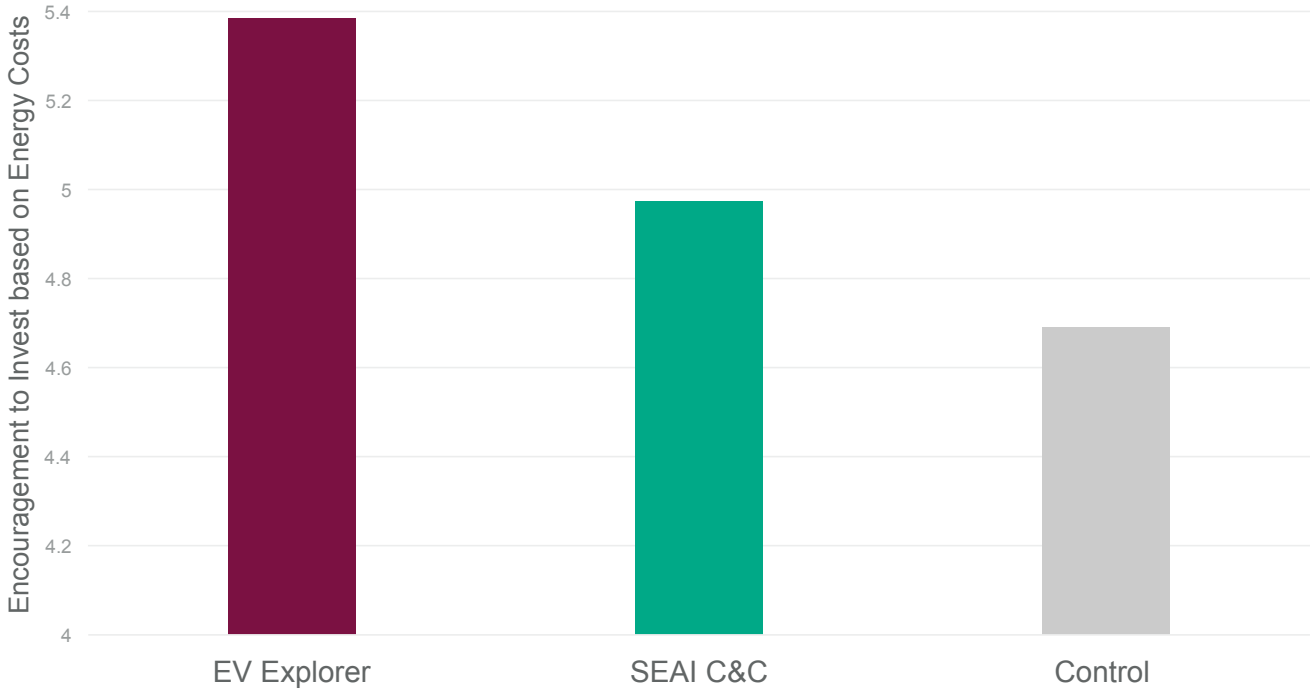
- Both tools provide the same typologies of information
- Both tools provide the same ‘take home’ message:
  - EVs are cheaper to run.
  - EV range is adequate for most commutes.

- EV Explorer frames information in a personalised and visually salient format.

- Cost calculator tools may be effective for changing investment intent when information is appropriately framed.

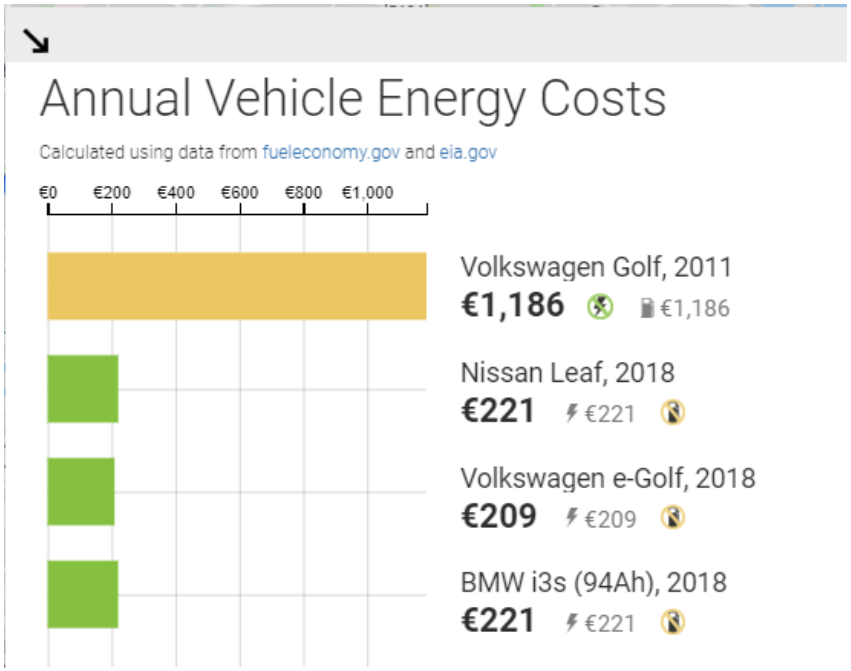
- Similar effects in other domains observed by BIT (2013) with personalised letters (charitable donations) and with Haynes et al (2013) with personalised text messages (court fine payments).

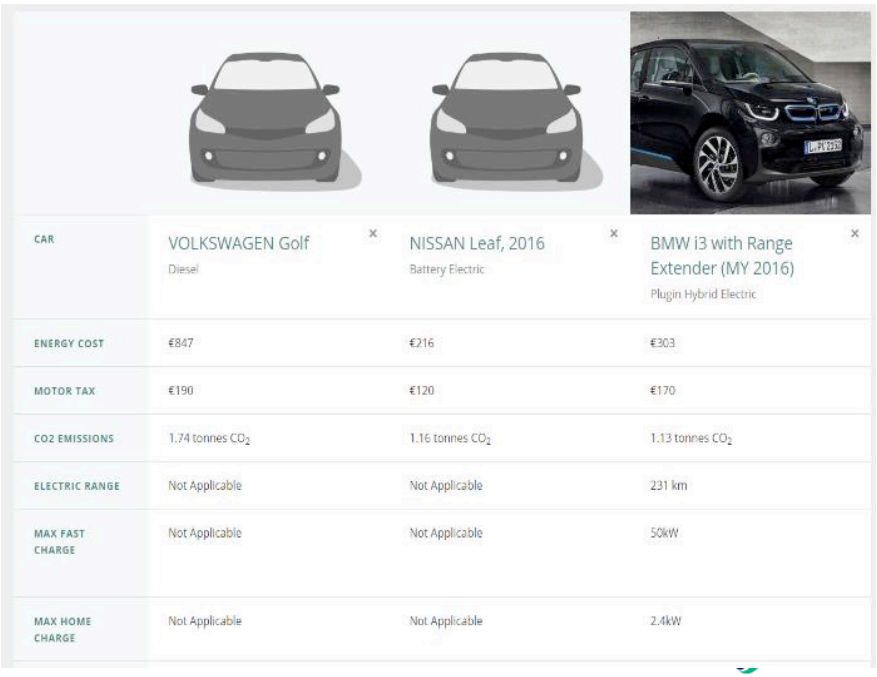
Results – Energy Costs



Energy Costs

- Significant difference in extent to which energy costs would encourage investment in an EV
- Colour coded bar graph vs. numeric table





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ENERGY COST	€847	€216	€303
MOTOR TAX	€190	€120	€170
CO2 EMISSIONS	1.74 tonnes CO_2	1.16 tonnes CO_2	1.13 tonnes CO_2
ELECTRIC RANGE	Not Applicable	Not Applicable	231 km
MAX FAST CHARGE	Not Applicable	Not Applicable	50kW
MAX HOME CHARGE	Not Applicable	Not Applicable	2.4kW

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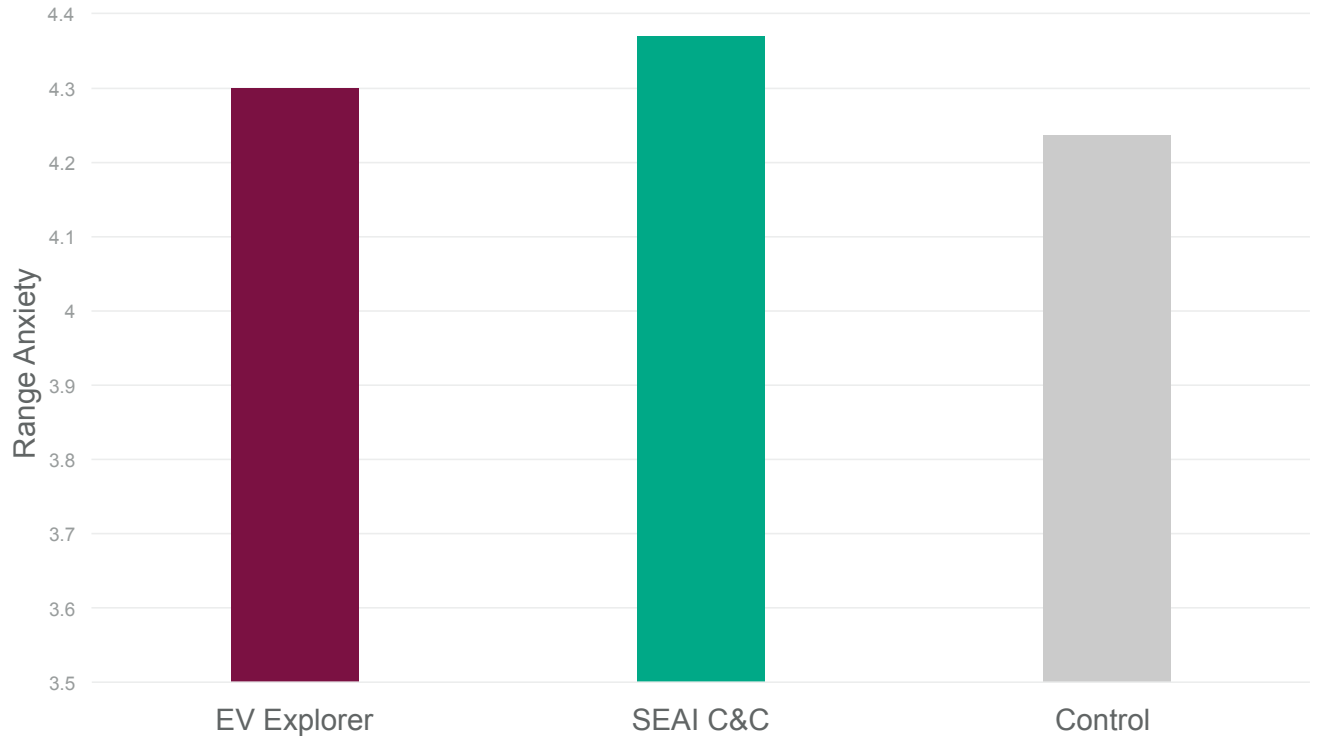
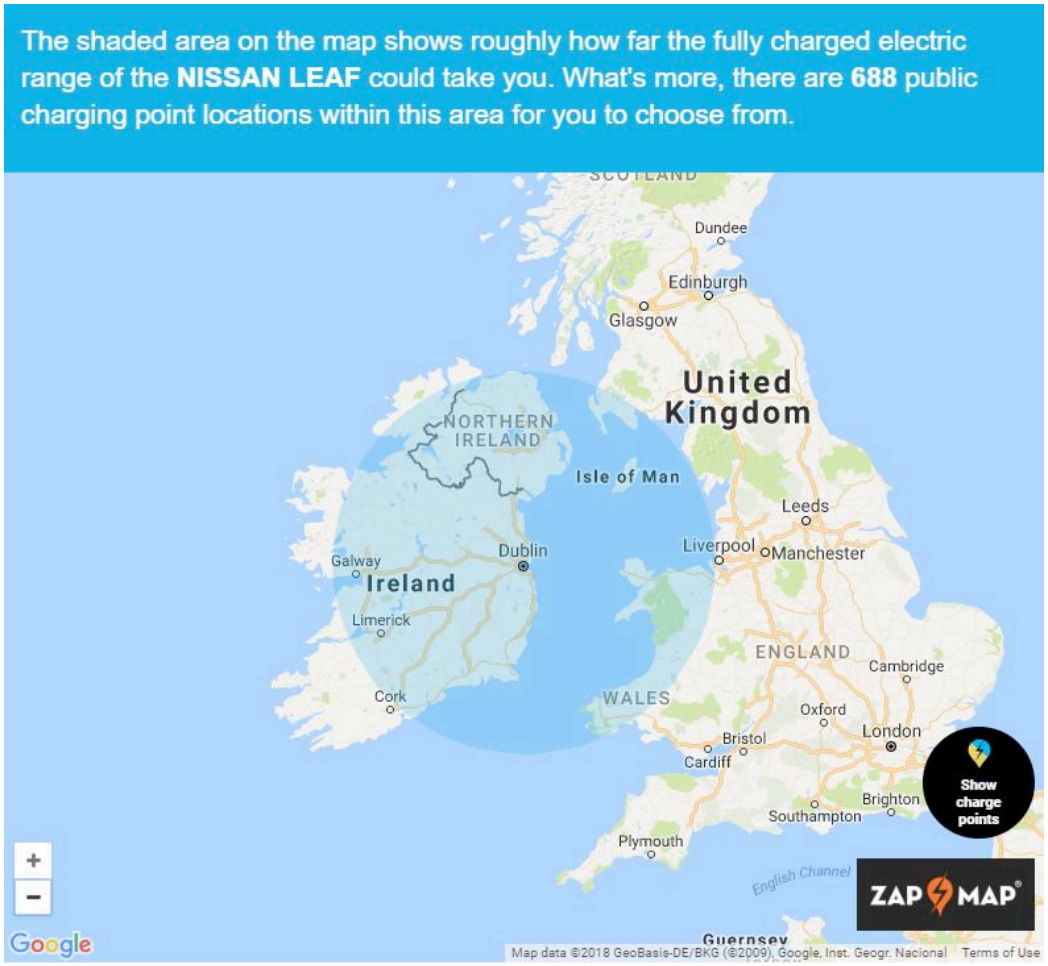
Results – Range anxiety



Range Anxiety

- No significant difference observed across conditions
- Range meter unnoticeable?
- Other ways of depicting range?
  - E.g. Go Ultra Low



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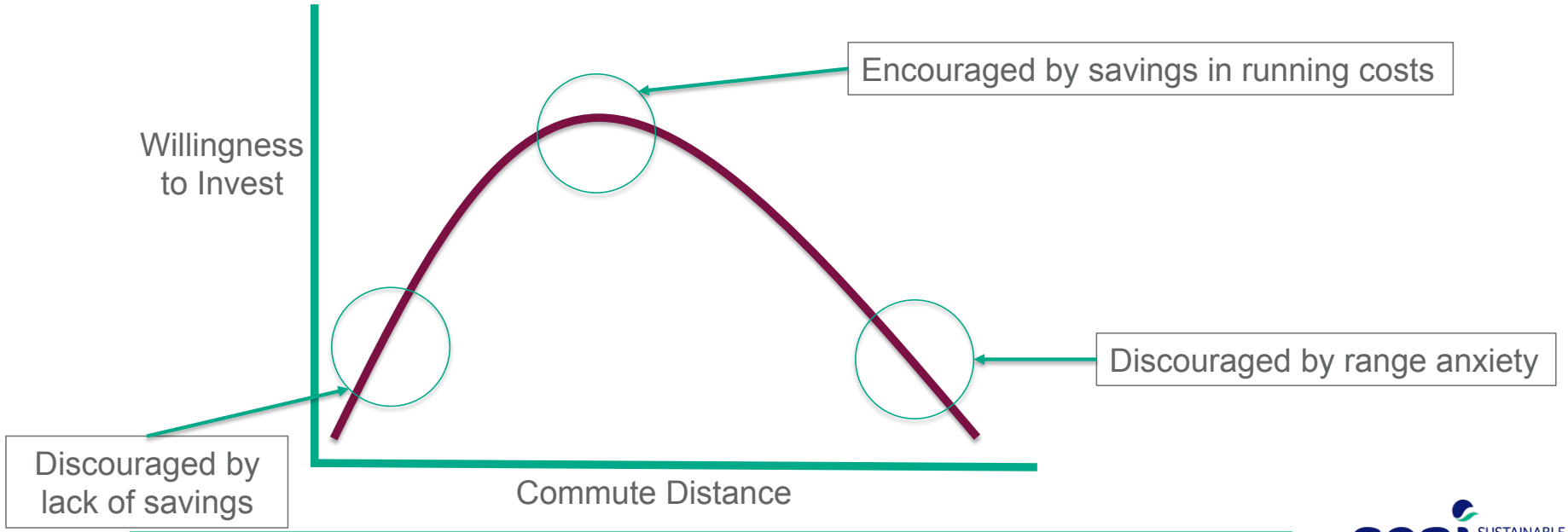
Settlement Type

- Rural dwellers have lower intention to invest and greater range anxiety but are more encouraged to invest in an EV based on energy costs
- Is there an n-shaped relationship between commute distance?



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Thank You
Declan.meally@seai.ie

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