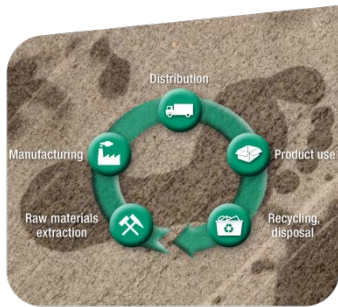


JR RESOURCES

– research activities relevant to transport

Life cycle based assessments of energy and transport systems



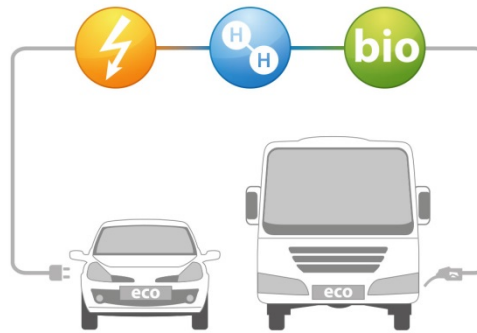
LCA



LCSA = LCA+LCC+SIA

Eco-mobility

Sustainable transport systems based on renewable fuels



Research partner for demonstration activities



Austrian flagship project: demonstration of fuel-cell range extender warehouse trucks (JR: LCSA, monitoring tasks)

IEA-HEV Task 27 Electrification of transport logistic vehicles

Development activities for renewable fuels for transport

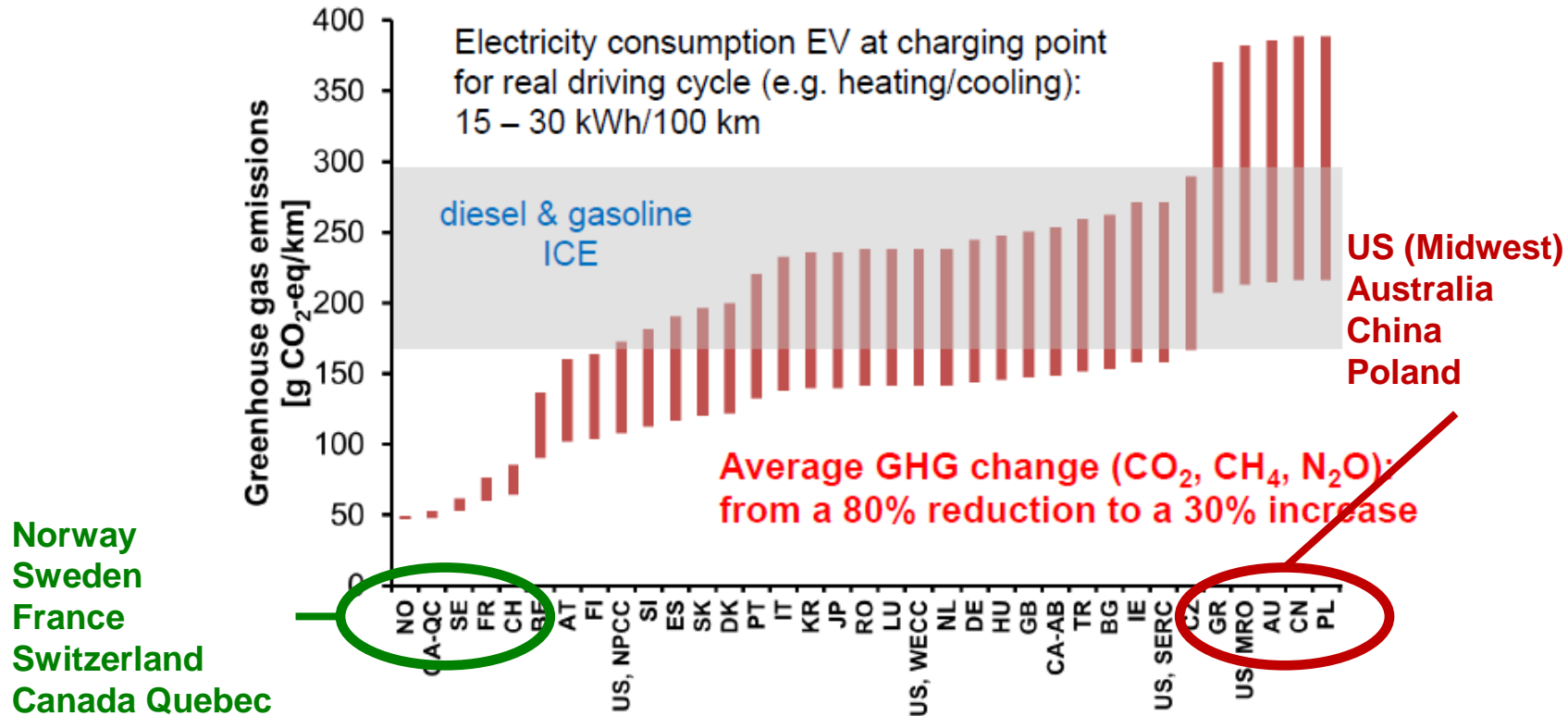


Co-production of H₂, O₂, heat @ H₂ fuelling station HyCentA, Graz

IEA-HEV Task 19 LCA of Electric Vehicles

Electric vehicles & GHG emissions- global perspective

GHG Emissions of EVs Current National Electricity Productions



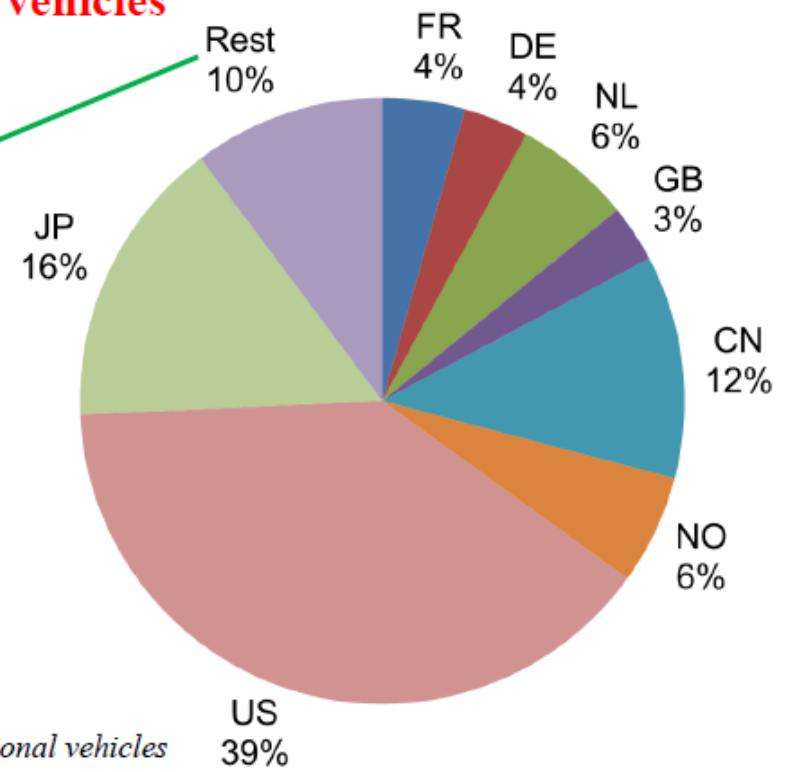
Electric vehicles & GHG emissions- global perspective

Vehicle Fleet Worldwide 2014



About 700,000 electric vehicles

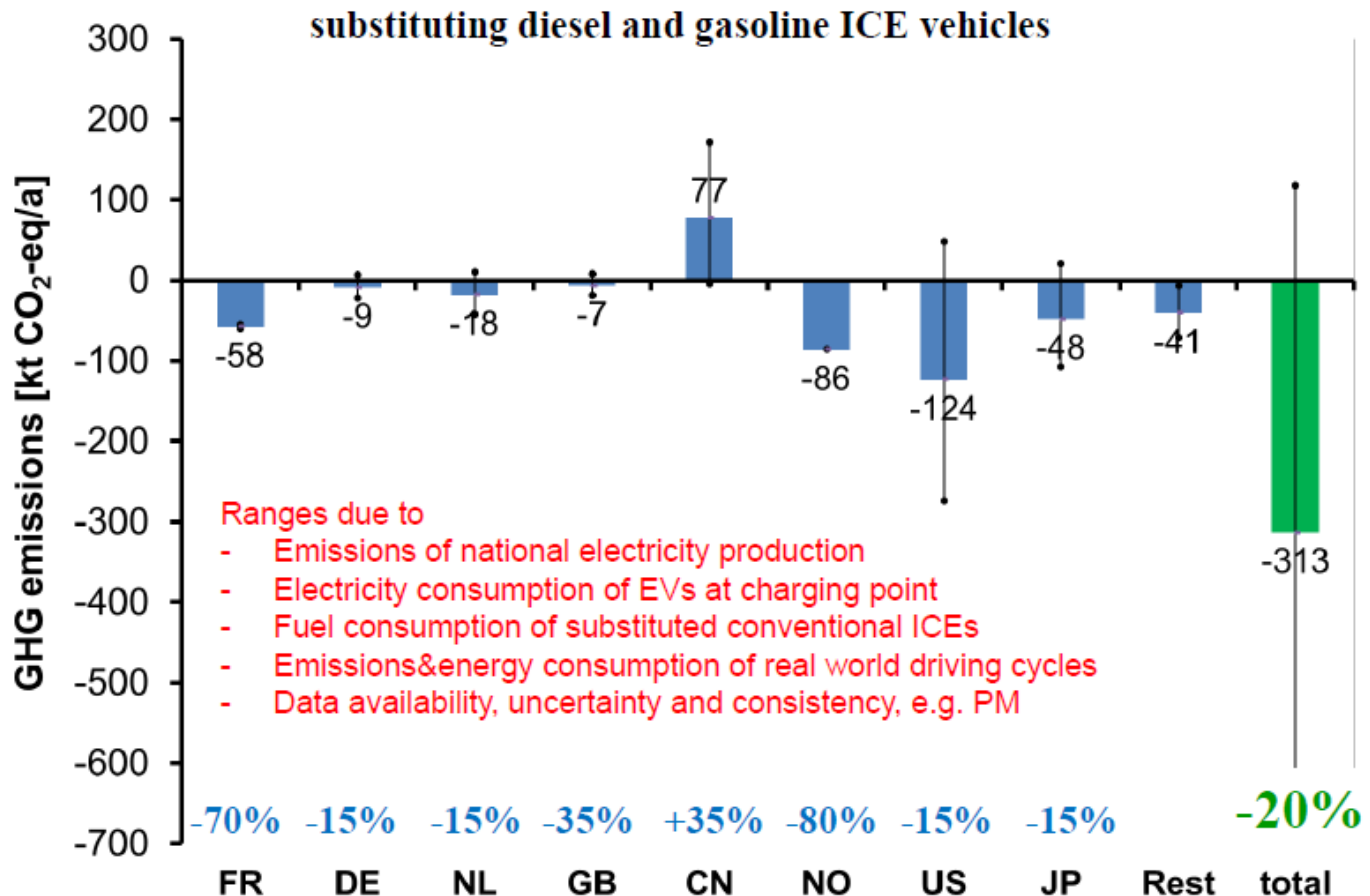
Rest: AT, BE, BG, CZ, DK, FI, GR, HU, IE, IT, LU, PL, PT, RO, SK, SI, ES, SE, AU, CA, CH, KR, TR, ID, SA



- Assumption:**
- BEV 65%, PHEV 35%
 - BEV: 14,000 km/a
 - PHEV 8,000 km/a (electric)
 - EVs substitute 95% of km driven by conventional vehicles

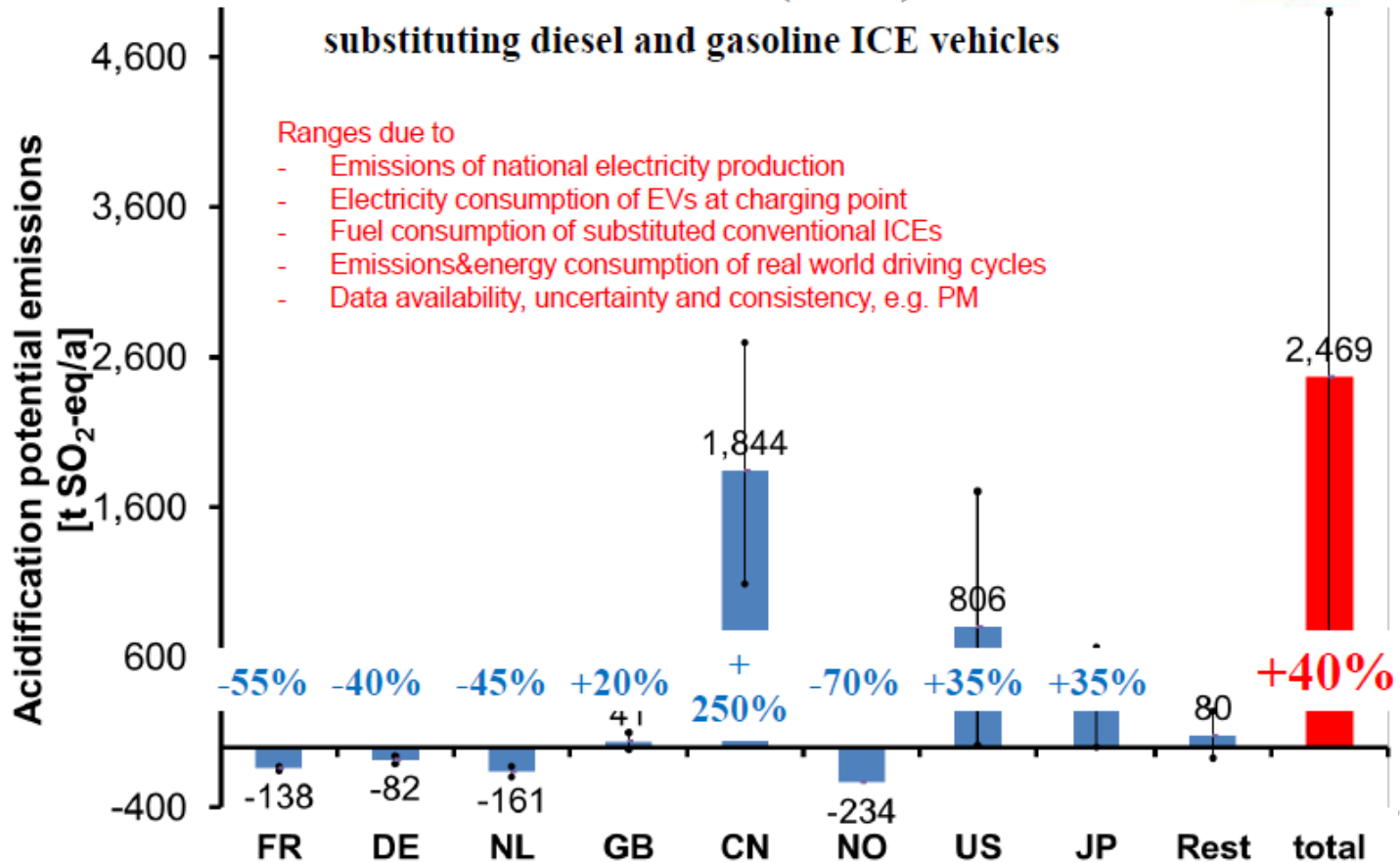
Electric vehicles & GHG emissions- global perspective

Estimated GHG-Emissions of Electric Vehicles Worldwide (2014)



Electric vehicles & GHG emissions- global perspective

Estimated NO_x – and SO₂-Emissions of Electric Vehicles Worldwide (2014)



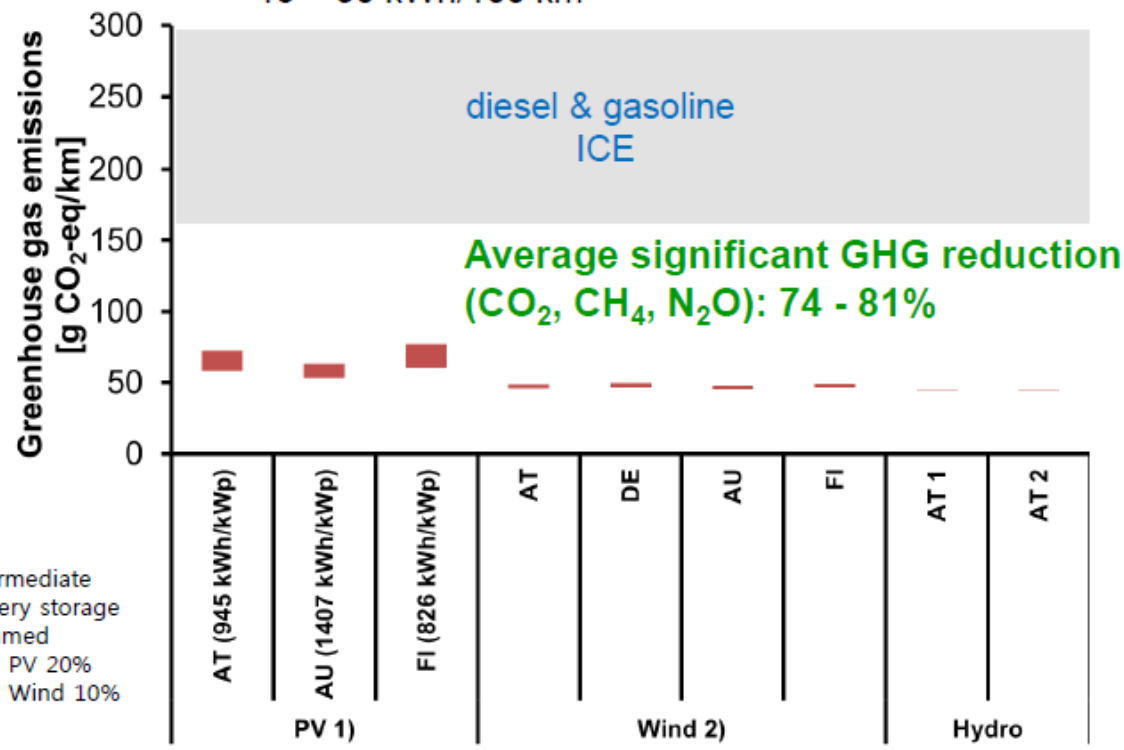
Electric vehicles & GHG emissions - global perspective

GHG Emissions of Electric Vehicles - Renewable Electricity



19

Electricity consumption EV at charging point for real driving cycle (e.g. heating/cooling):
 15 – 30 kWh/100 km



Intermediate battery storage assumed
 1) PV 20%
 2) Wind 10%