

# Estimating National Carbon Quotas and Modelling the Role of NETs in Compatible Emission Pathways at a Small Nation Scale

Barry McMULLIN<sup>1</sup>, Paul PRICE<sup>1</sup>, Michael B. JONES<sup>2</sup>, Alwynne H. McGEEVER<sup>2</sup>  
<sup>1</sup>Dublin City University, Ireland <sup>2</sup>University of Dublin, Trinity College, Ireland

## A case study estimating the remaining national CO<sub>2</sub> quota for Ireland to align policy with Paris

### Objectives:

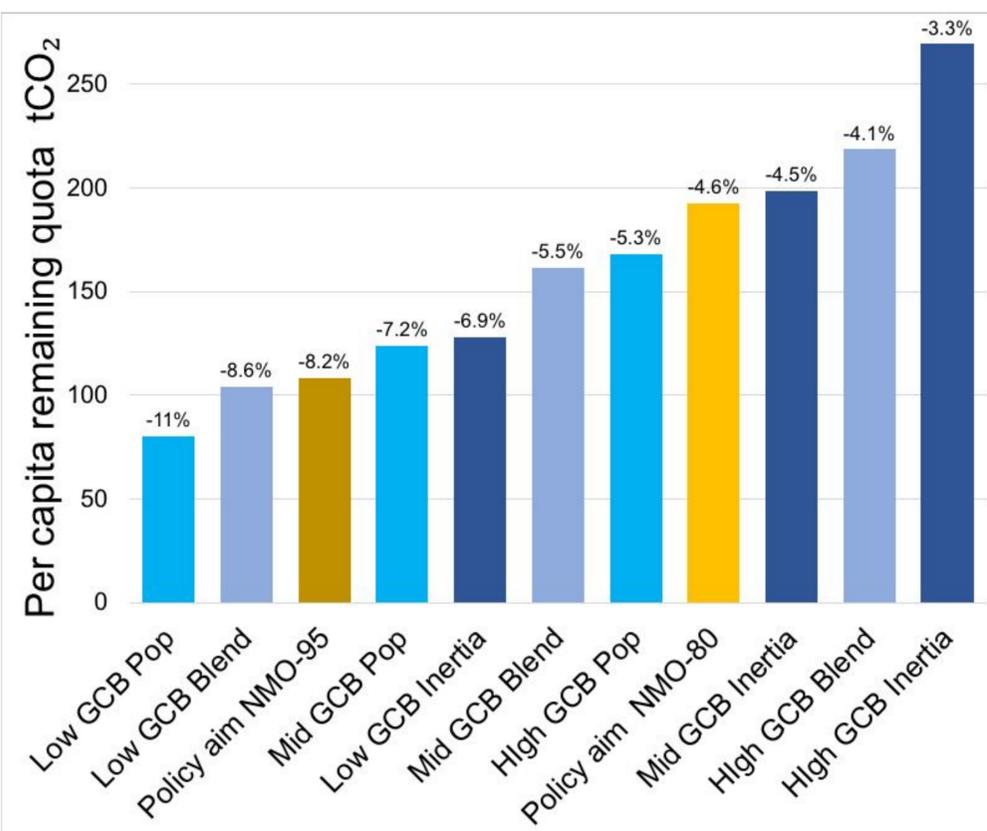
- Guide national CO<sub>2</sub> mitigation policy in line with the Paris Agreement
- Quantify tacitly emerging national commitment to early CO<sub>2</sub> removal and storage (NETs)

### The Paris 2°C Global Carbon Budget (GCB)?

“For policy-making in the context of the UNFCCC, we suggest using the 590–1240 GtCO<sub>2</sub> estimate from 2015 onwards for a likely [>66%] chance of limiting warming to below 2°C” — Rogelj et al. 2016

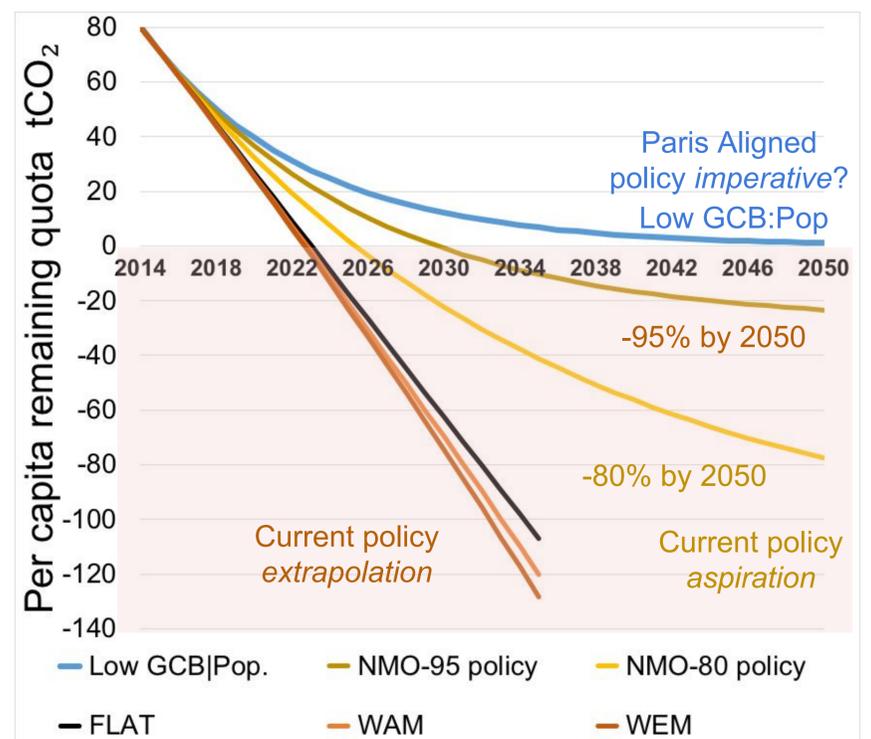
### Ireland’s possible CO<sub>2</sub> quota + mitigation rate

Blue bars: GCB range shared by population, inertia or “blend” (Raupach et al. 2014). Yellow bars: exponential pathway to 80% or 95% below 1990 by 2050.



### Committing to negative emissions?

- Evolution of Ireland’s post-2015 CO<sub>2</sub> quota (Raupach Low GCB:Population sharing scenario)
- Current policies commit rapidly to CO<sub>2</sub> “bankruptcy” (early large scale NETs deployment?)



### Ireland’s “Paris-aligned” imperative?

- Maximum prudent global per capita CO<sub>2</sub> quota post-2015? c. 80 tCO<sub>2</sub> (via Rogelj et al)
- Irish 2015 per capita nett CO<sub>2</sub> emission rate: 8.9 tCO<sub>2</sub>/yr (FFI+LUC)
- **Therefore:** Paris-aligned policy imperative is -11% per year nett decarbonisation
- Based on *minimal* interpretation of *prudence* (66% < +2°C, low GCB) and *equity* (Raupach population sharing: *still* neglects history and capacity)
- Required rate rises non-linearly with delay
- **Current policies quickly commit to highly speculative (untested, uncosted) CO<sub>2</sub> removals at very large scale?**
- **Moral hazard:** risks of NETs shortfall imposed on “others” (elsewhere/in the future)

### References:

Raupach, M.R. et al., 2014. Sharing a quota on cumulative carbon emissions. Nature Climate Change, 4(10), pp.873–879.  
 Rogelj, J. et al., 2016. Differences between carbon budget estimates unravelled. Nature Climate Change, 6(3), pp.245–252.

**Or: are we actually “choosing to fail”?**