MaREI
Energy · Climate · Marine

A World Leading SFI Research Centre

Science Foundation Ireland sfi For what's next

Power Sector Overview

Presenter : Paul Deane

ESRI 2025

HOST INSTITUTION

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

PARTNER INSTITUTIONS

CIT Cork Institute of Technology
DIAS
Dundalk Institute of Technology
ESRI Economic & Social Research Institute
Maynooth University
NUI Galway
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FUNDED BY:

Ireland's European Structural and Investment Funds Programmes 2014-2020
European Union
European Regional Development Fund
Science Foundation Ireland sfi For what's next

I will focus on Three Topics

Are electricity imports from the UK good for the environment?

Is the Carbon Border Adjustment Mechanism helpful?

What is the expected trajectory of the Power System in Ireland to 2030?

Topic 1

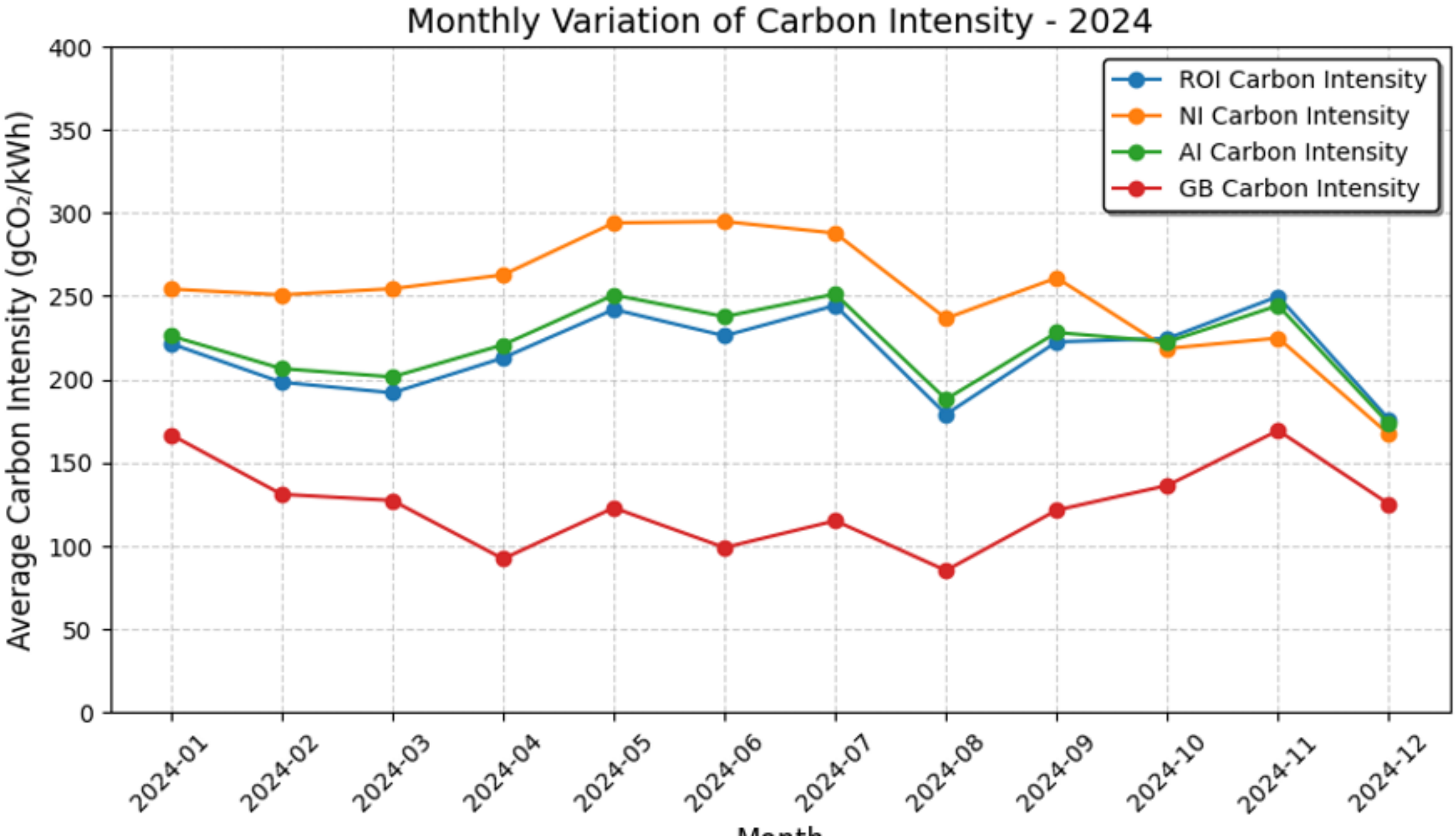
Are electricity imports from the UK good for the environment?

Dissertation Title:

Quantifying the Carbon Emissions Impact of Electricity Imports to Ireland

Student Name: Brian Whooley

Course: ME Energy Engineering


Monthly Variation of Carbon Intensity - 2024
Average Carbon Intensity (gCO₂/kWh)
400
350
300
250
200
150
100
50
0
ROI Carbon Intensity
NI Carbon Intensity
AI Carbon Intensity
GB Carbon Intensity
2024-01
2024-02
2024-03
2024-04
2024-05
2024-06
2024-07
2024-08
2024-09
2024-10
2024-11
2024-12
Month

What we found

Imported electricity carried approximately 720 thousand tonnes of embedded CO_2 from the UK

If the same volume of electricity had been generated domestically at the same time it would have produced 1.2 million tonnes

This is a **net benefit** of 481 thousand tonnes of CO_2

Carbon Border Adjustment Mechanism

Topic 2

Is the Carbon Border Adjustment Mechanism helpful?

CBAM for Electricity for All Island System

It is not clear that there is a problem of Carbon leakage to be addressed

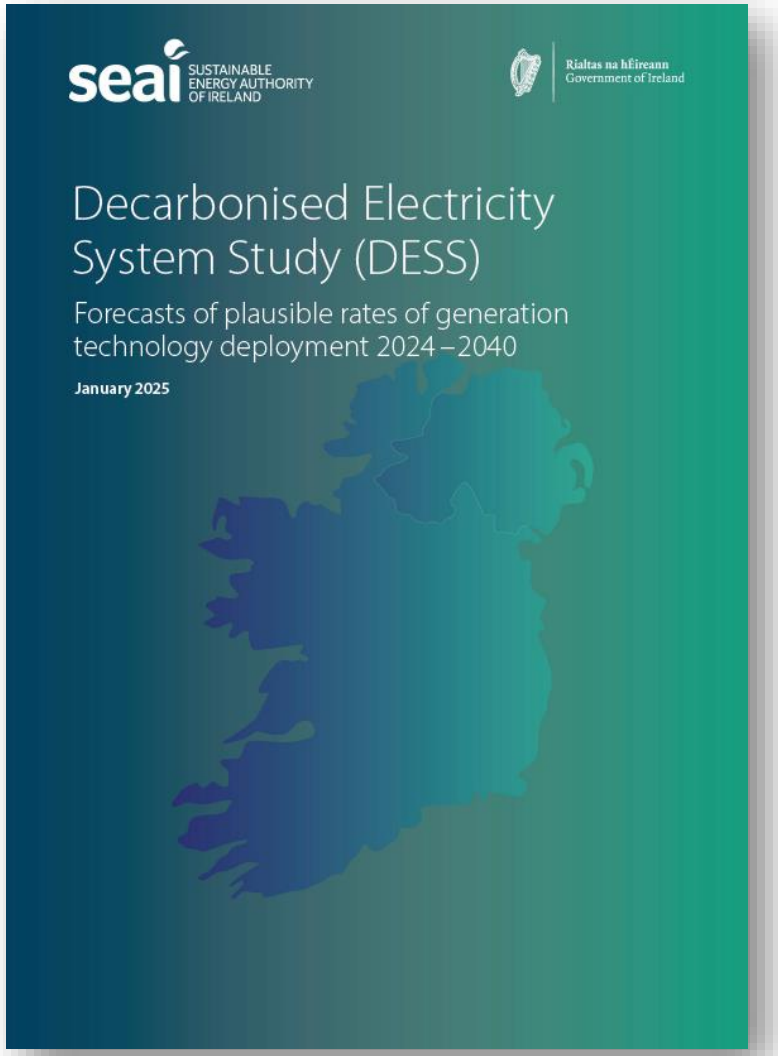
There is a genuine risk that CBAM will create disproportionate administrative burdens and costs compared to the emissions reduction that it could potentially deliver

The CBAM methodology is flawed because it looks to tax historic emissions rather than actual emissions

Topic 3

What is the expected trajectory of the Power System in Ireland to 2030?

Electricity Demand is projected to grow quickly; supply expected to come online slowly



Today Ireland is at 40% renewable electricity

The same projected supply of renewable electricity in 2030 leads to different Renewable Electricity (RES-E) outcomes because RES-E Penetration is a function of Demand

Low Build Out of Data Centers- 2030	Medium Build of Data Centers- 2030	High Build Out of Data Centers- 2030
74% RES-E	65% RES-E	59% RES-E

I focused on Three Topics

Are electricity imports from the UK good for the environment? YES

Is the Carbon Border Adjustment Mechanism helpful? NO

What is the expected trajectory of the Power System in Ireland to 2030?
Challenging