

The economic and distributional impacts of an increased carbon tax with different revenue recycling schemes

DATE

28 January 2021

VENUE

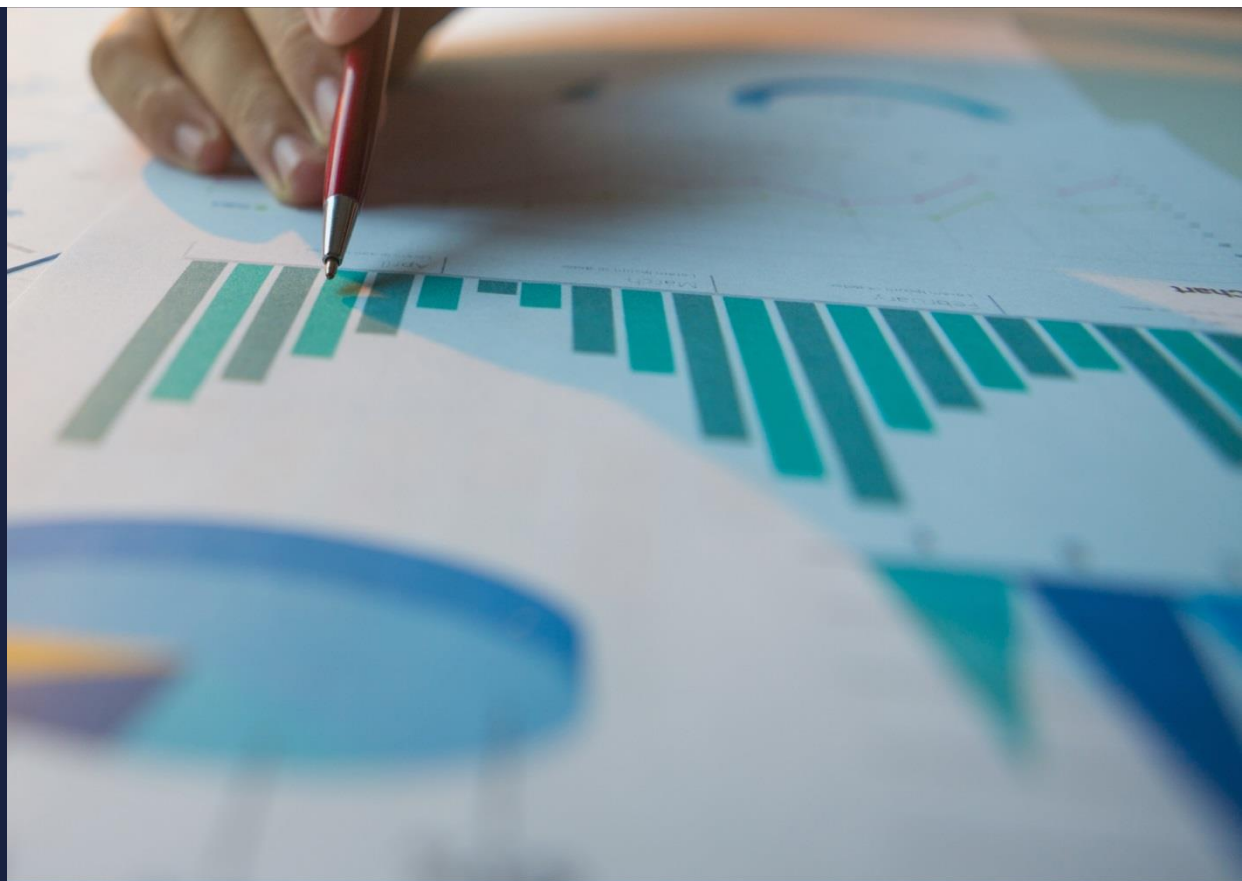
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Thank you to :

the **Department of Environment, Climate and Communications** for funding the ongoing I3E work

The **Department of Finance** for funding this specific paper

Introduction: Climate targets

- Climate policy is becoming increasingly important
- Under the **Paris Agreement**, the EU have set their Intended Nationally Determined Contribution (INDC):
- 40% reduction of GHG emissions
- EU wide carbon allowance market: EU-ETS
- Individual member states have legally binding non-ETS emissions target
- For Ireland **30% reduction in 2030** compared to 2005
- Ireland is not on track to meet these targets, calling for additional policies

Introduction: Irish carbon tax

- At the forefront of the climate policy debate is carbon pricing
 - cost effective
 - raises revenues
 - directly impacts carbon prices, disincentivising their use.
- Carbon taxation can have **negative economic effects**, and **disproportionately** impacts different households types or production sectors.
- The Irish government implemented a carbon tax in 2009
- The Climate Action Plan of 2019 commits to a gradual carbon tax increase reaching **80€ in 2030**

Introduction: Double dividend

- **Double dividend:** carbon revenues can be used to reduce other distortionary taxes and boost the economy
- Revenues can be transferred to households to compensate and reduce unequal impacts
- We examine what the impacts a carbon tax and several “**revenue recycling schemes**” on:
 - Emissions
 - Macroeconomy
 - Production sectors
 - Household types

Introduction: Revenue recycling schemes

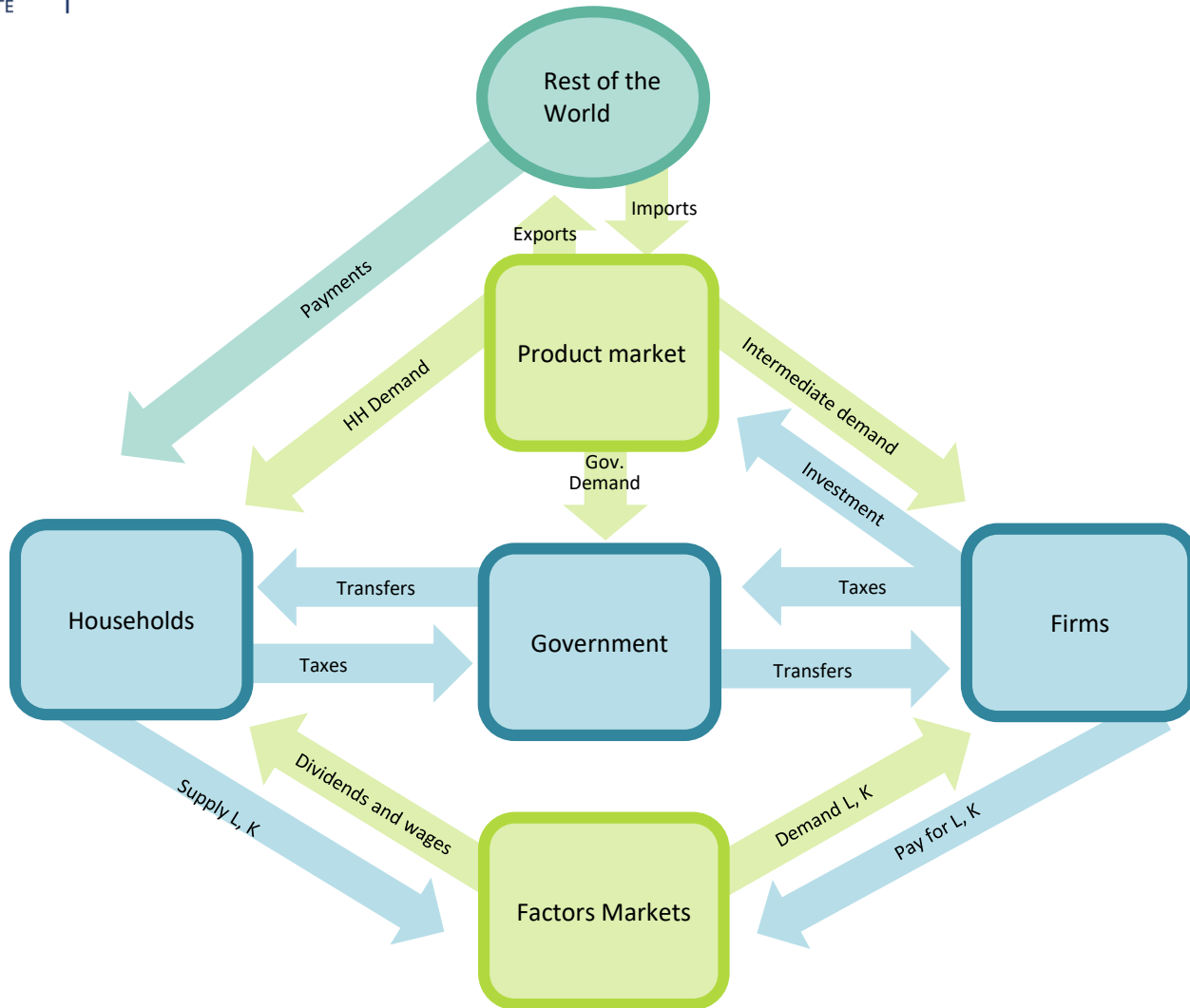
- No recycling: reduction of debt stock
- Decrease in corporate tax
- Decrease in wage tax
- Lump sum transfers to households
- Welfare dependent transfers



Methodology

Methodology: I3E model

- Ireland Environment, Energy and Economy model
- <https://www.esri.ie/current-research/the-i3e-model>
- Dynamic Computable General Equilibrium model
- **Features**
 - Detailed representation of **production sectors** (32 sectors)
 - Detailed representation of **consumption goods** and services (39 commodities)
 - Inclusion of explicit **carbon commodities**
 - **Emissions** from combustion (ETS and non-ETS)
 - Detailed modelling of **government** sector
 - **Households** specification with 10 representative household groups (5 urban, 5 rural)
 - 3 **labour** types: low, medium and high skilled





Results

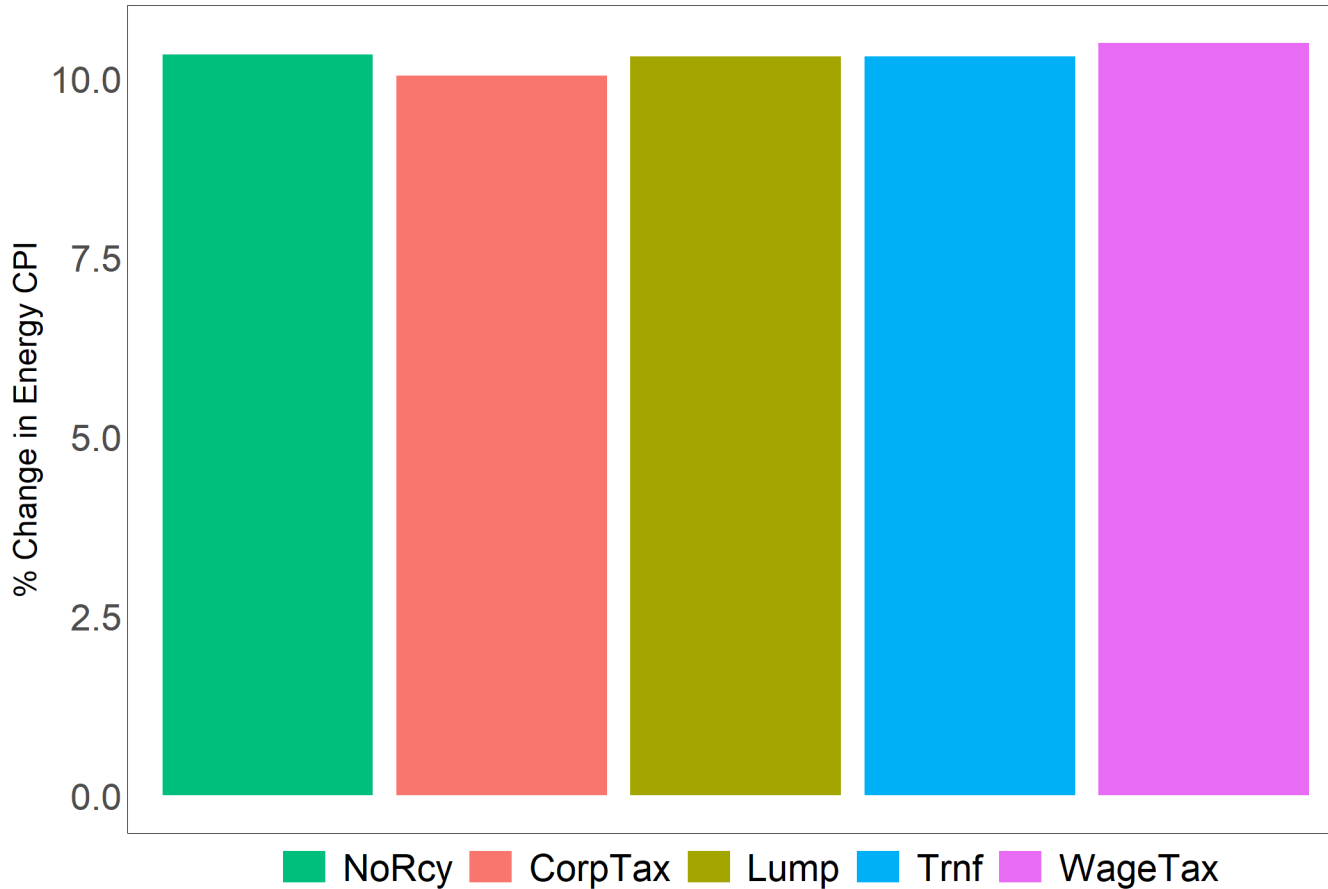
Scenarios

NAME	DESCRIPTION
BaU	Business as usual – no policy change
NoRcy	No recycling – debt reduction
WageTax	Reduction in wage tax rates
CorpTax	Reduction in corporate tax rate
Lump	Lump sum transfers to households on a per capita basis
Trnf	Transfers to households on social welfare transfer basis

Results: Prices

- A carbon tax increase, increases **energy prices** directly
- And **other prices** indirectly
- These price changes drive **behavioural change**

Energy Prices



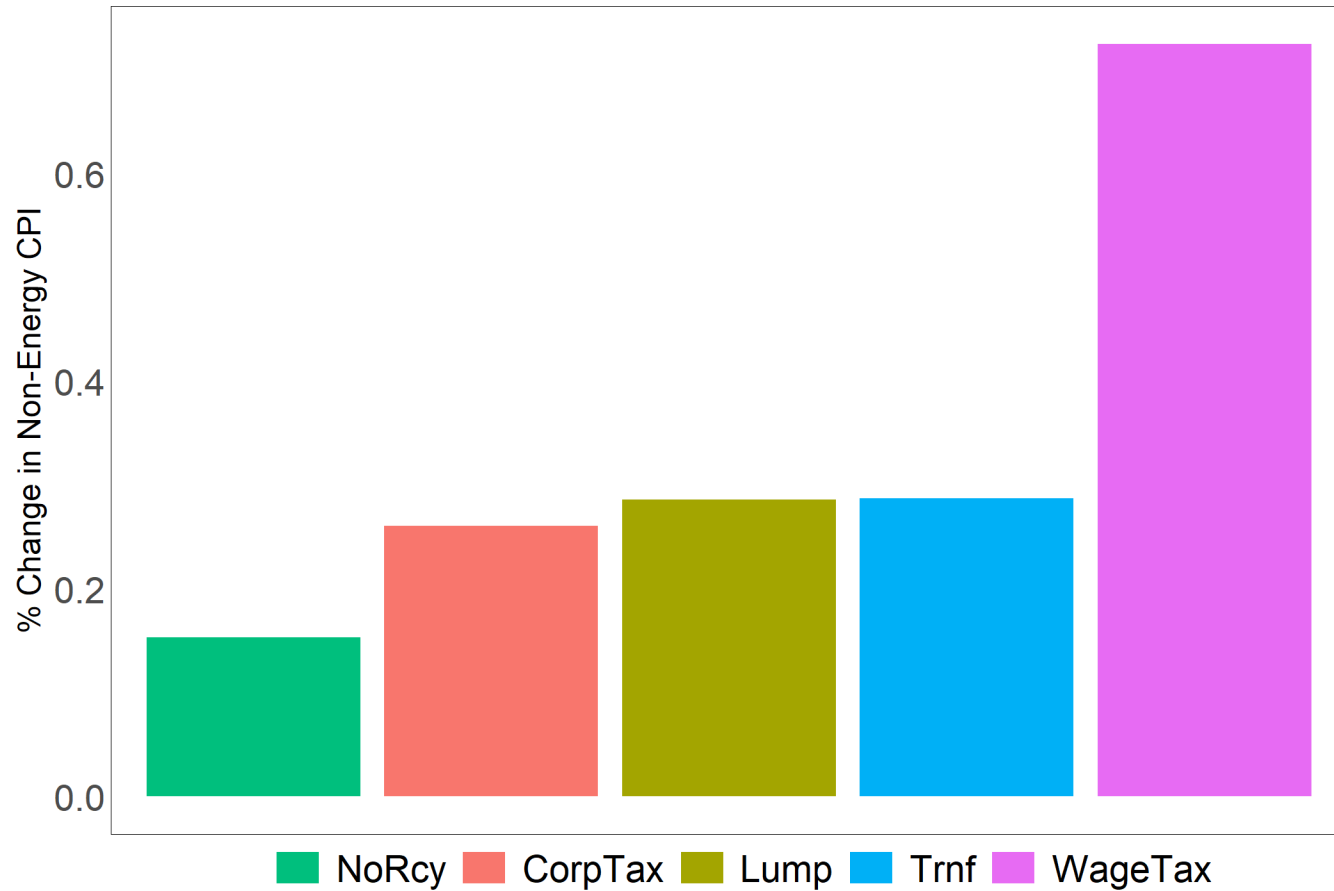
- Big impacts on energy prices
- Negligible impacts of recycling scheme

Non-Energy Prices

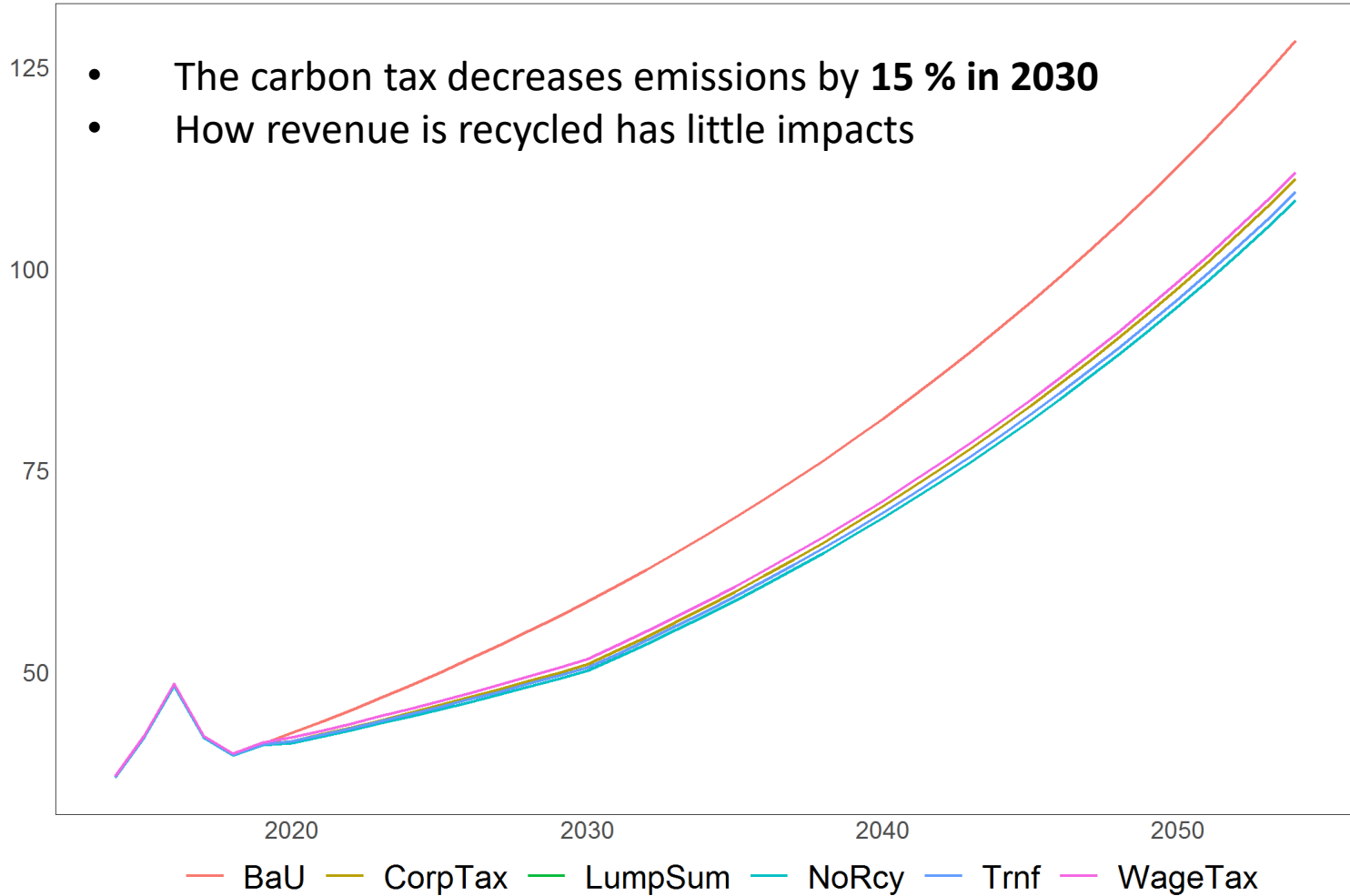
Prices are determined by:

- **Increases in production costs** (supply side)
- **Changes in demand due to**
 - **lower economic activity**
 - **lower household income**

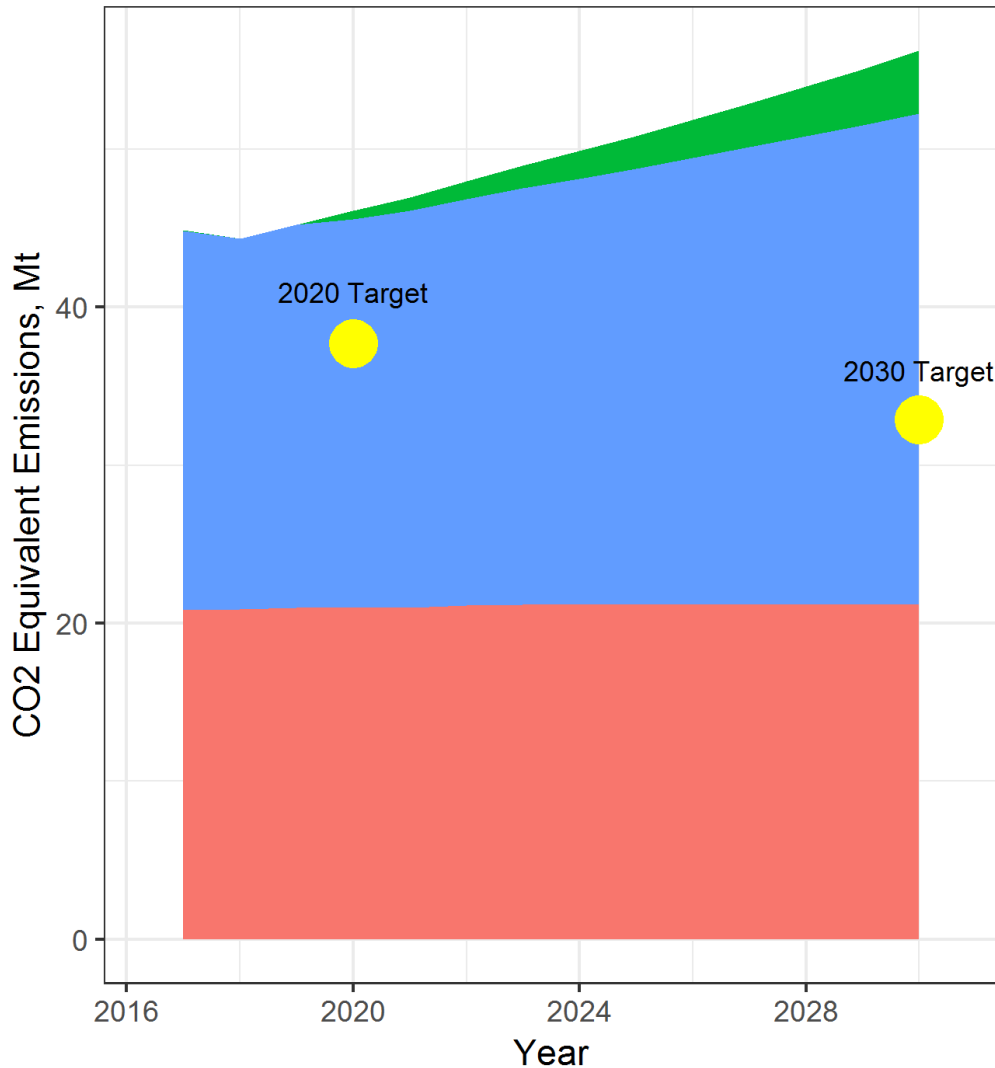
Non-Energy prices



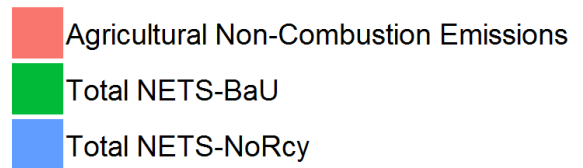
Emissions



Non-ETS target



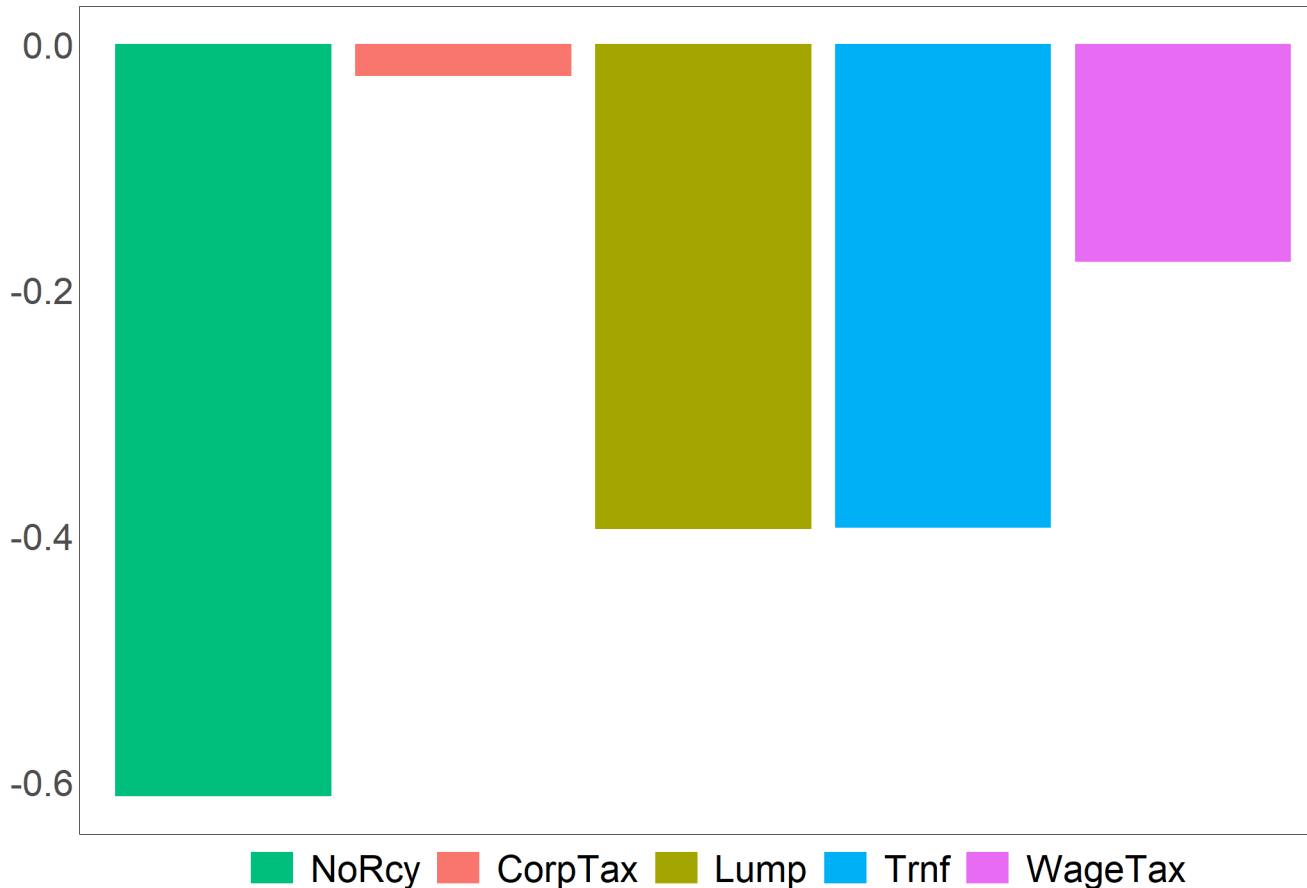
- EU Non-ETS target remains out of reach



Macroeconomic impacts

- Increased prices reduce demand
- Lower demand reduces supply and thus economic activity
- However, recycling can stimulate demand by transfers and supply by tax reductions

% change in Real GDP compared to BaU

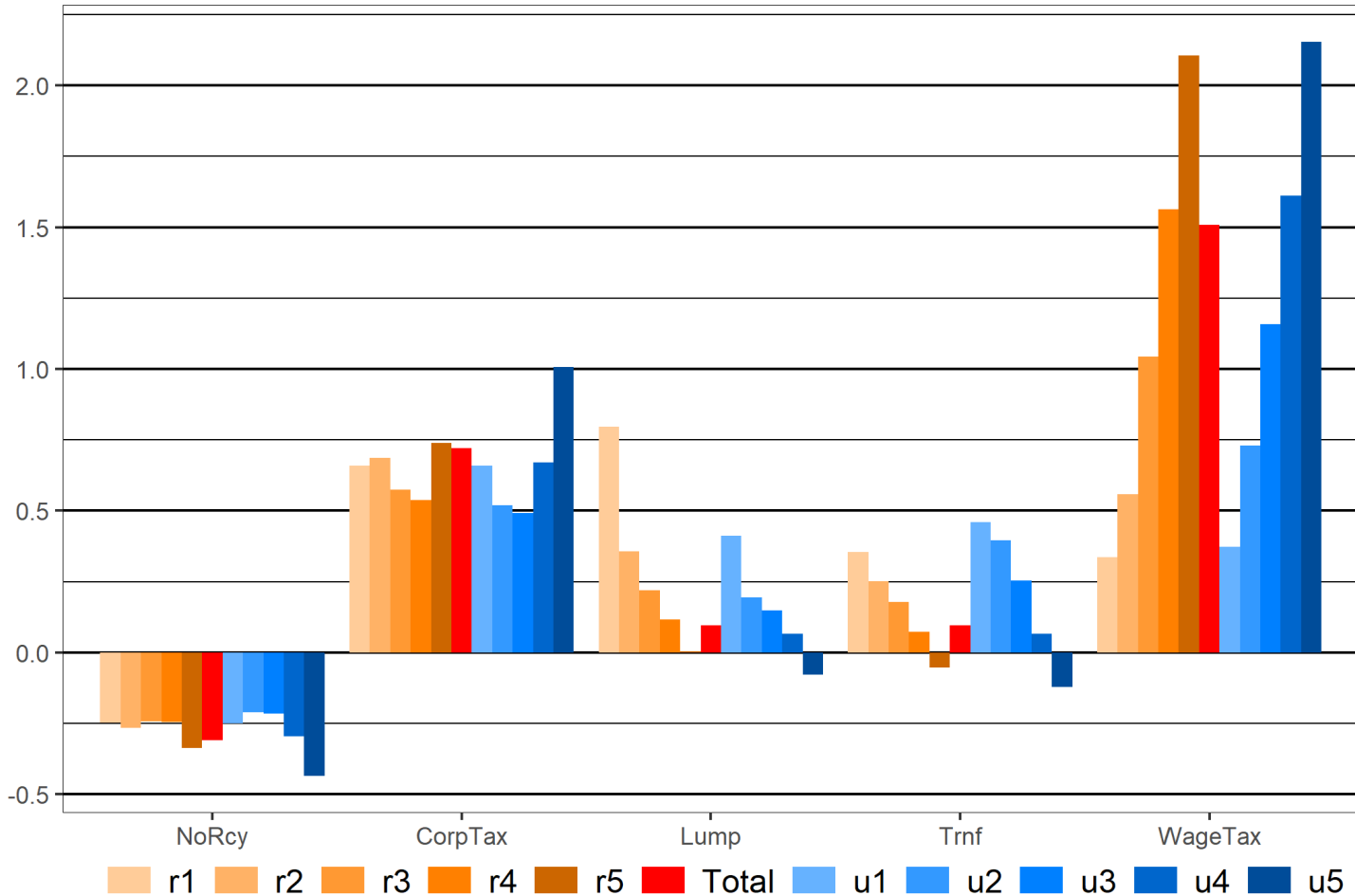


- Weak Double dividend for all recycling schemes
- Transfers to households increase demand
- Decreased taxes stimulate supply

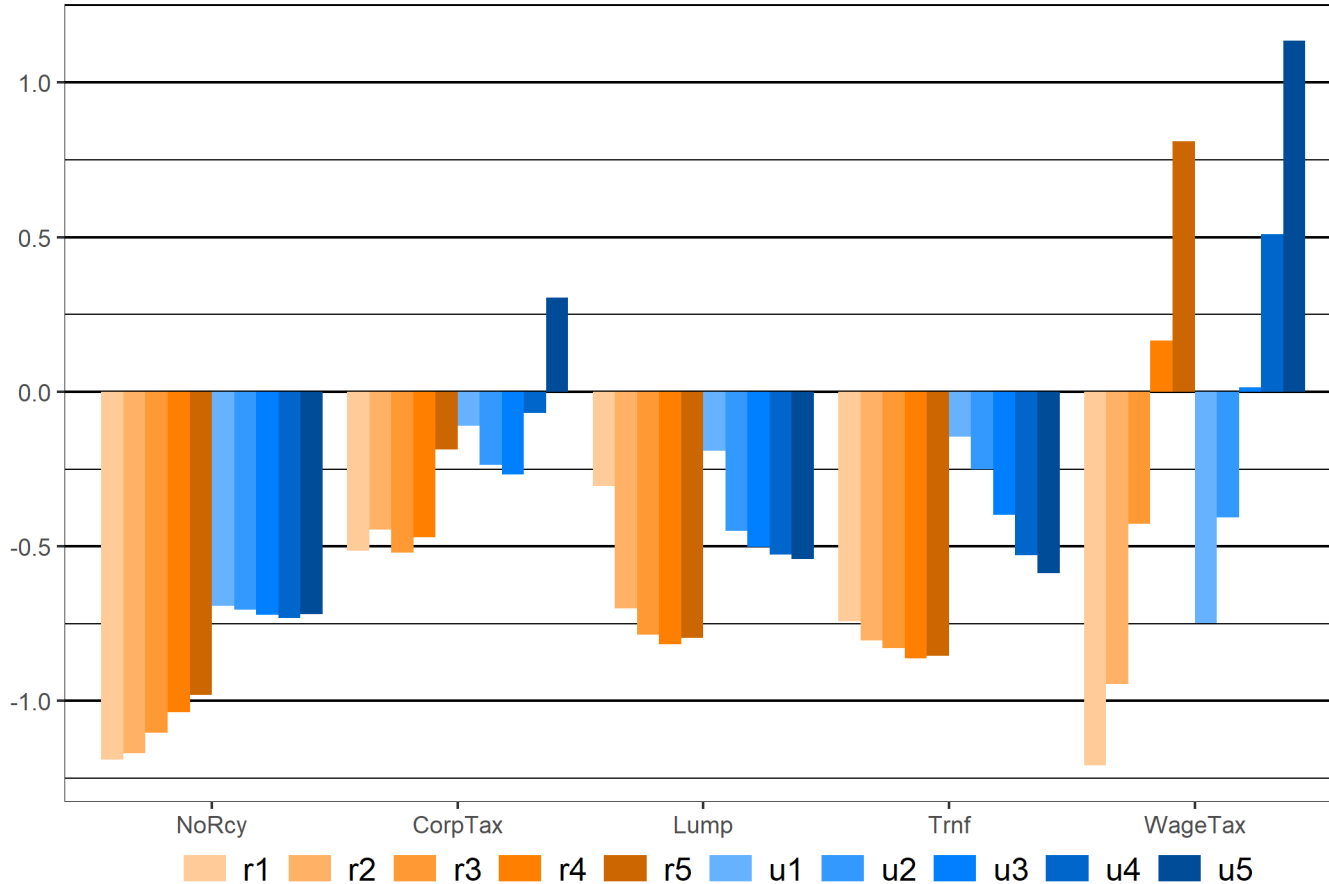
Sector level impacts

- The sectors transport (-3.8%), electricity (-1.8%) and mining (-1.5%) are most impacted in terms of value added
- Other sectors face varying impacts depending on the revenue recycling scheme applied

% change in disposable income compared to BaU across household types



% change in consumption compared to BaU



Conclusion

- The level of total combustion **CO2 emissions** reaches 50 million in 2030 with an increased carbon tax. This figure is **15% lower** than the BaU, and 4.2% higher than its 2005 level.
- **More policies** are needed to ensure Ireland reaches its EU non-ETS targets
- The impacts of an increased carbon tax will depend on what is done with the revenues
- **No revenue recycling** leads to the **highest emission reduction** but at the cost of lower GDP and household disposable income.
- Using carbon tax revenues to **reduce other taxes** can boost economic activity and **lessen the GDP** and income impacts of a carbon tax
- However, this comes at the expense of increasing the income inequality
- Recycling revenues as **transfers to households** can also boost economic activity (to a lesser degree) by increasing households income and has **progressive** impacts reducing inequality across households
- The discussion around a carbon tax should include how the revenue will be used as this is the main determinant of the economic impacts