



# The I3E Model

## A Broader Economic Assessment of the Carbon Budgets

Kelly de Bruin, Mert Yakut

# Introduction

- The Carbon budgets will have large impacts across firms and households
- Different aspects studied individually
- Carbon policies in different sectors will affect each other
- We need to understand these interactions
- A complete analysis of carbon budgets is extremely complex
- The I3E model is built for this purpose but lacks detailed modelling of certain aspects
- We aim to create a better understanding of the overall impacts of the carbon budgets by developing and linking I3E

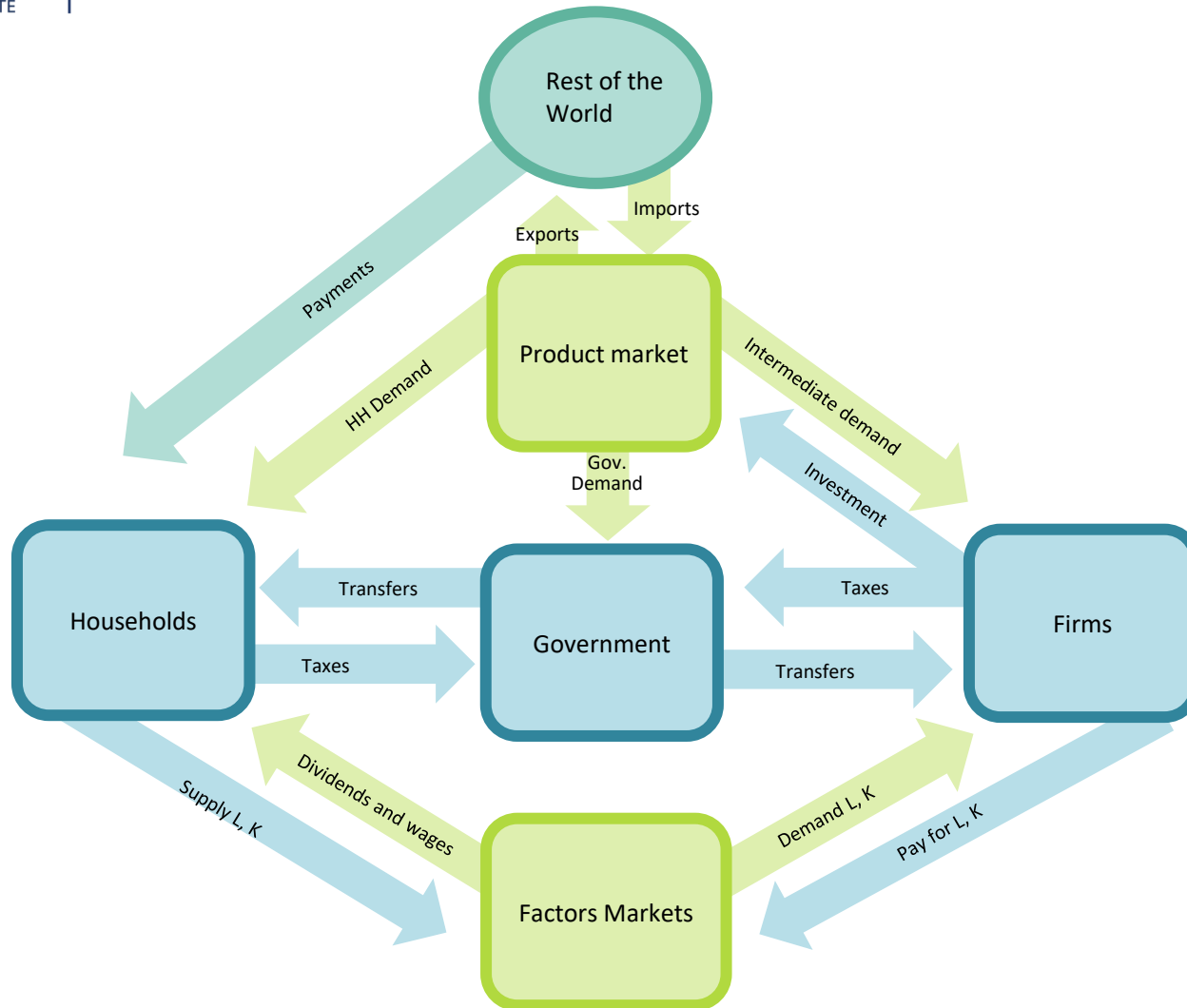
# The I3E model

- 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** (39 sectors)
  - Detailed representation of **consumption goods** and services (42 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

## I3E: Agents

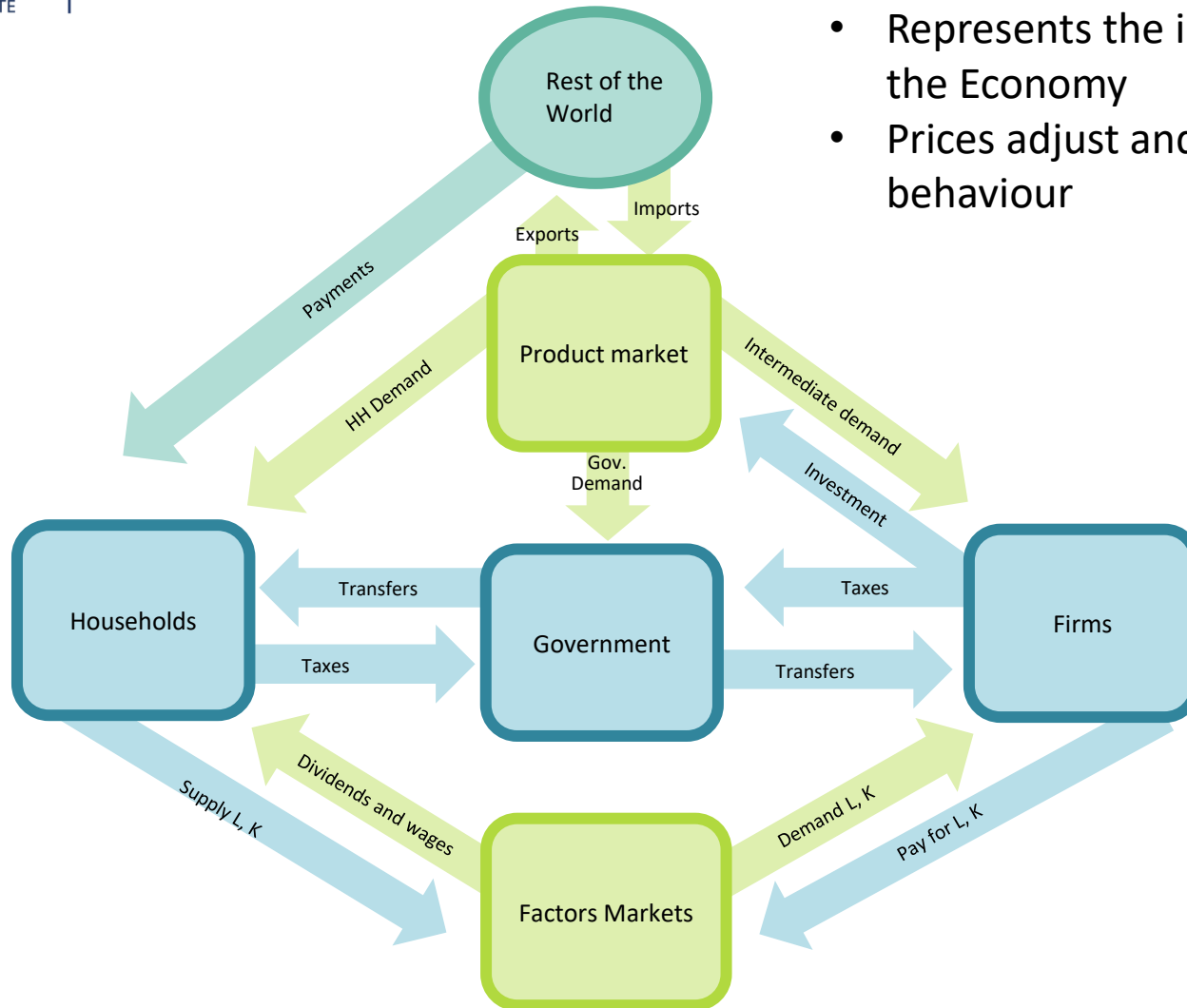
- **Households:** maximise utility through consumption demand, provide capital and labour. Receive government transfers (social benefits and pension), labour and capital income.
- **Production Sectors:** maximise dividends through production, consume labour and capital.
- **Government:** receives taxes (VAT, production, corporate, carbon, wage) and transfers to production sectors and households.
- **ROW:** Imports from and exports to Ireland.

# I3E overview

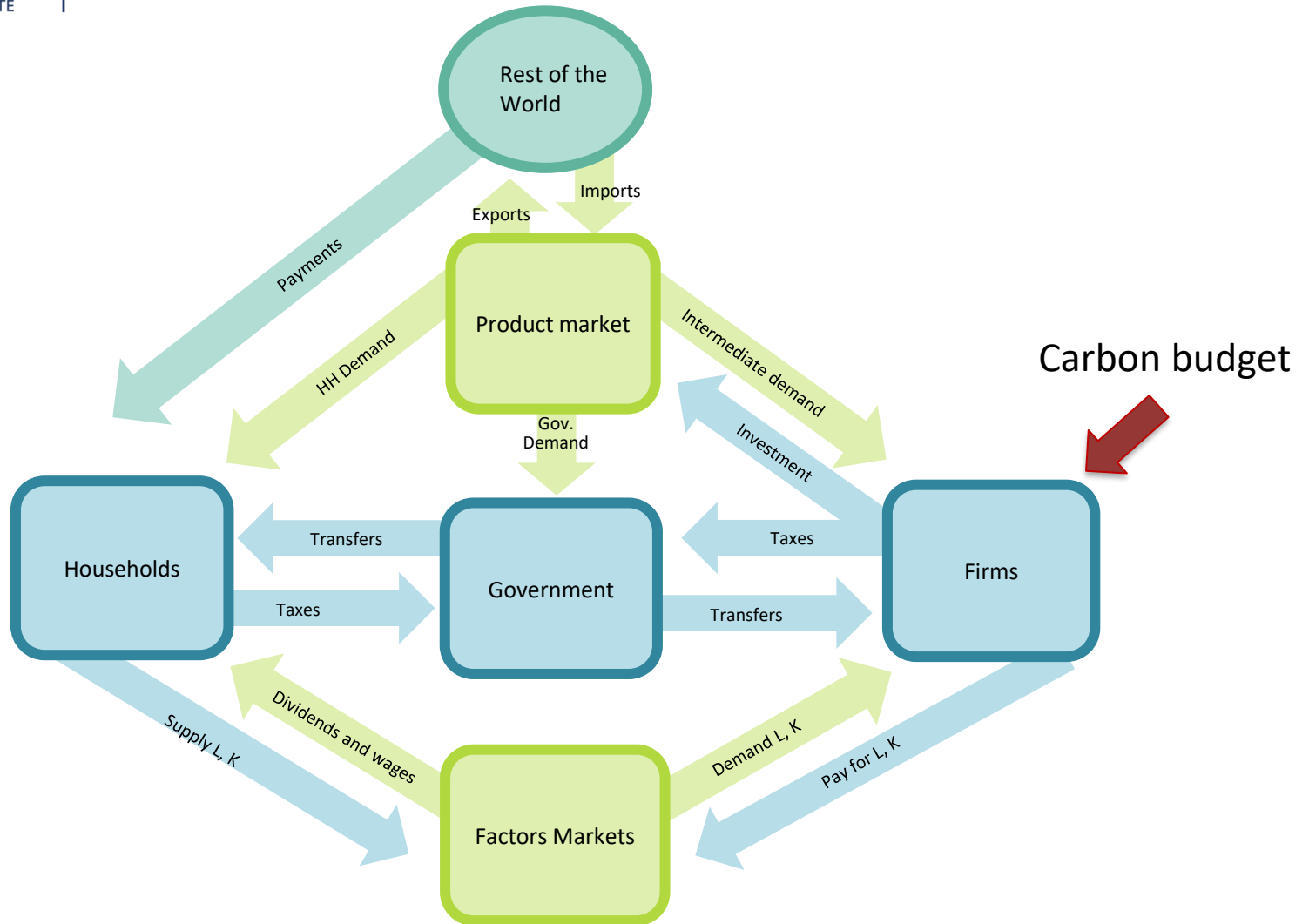


# I3E overview

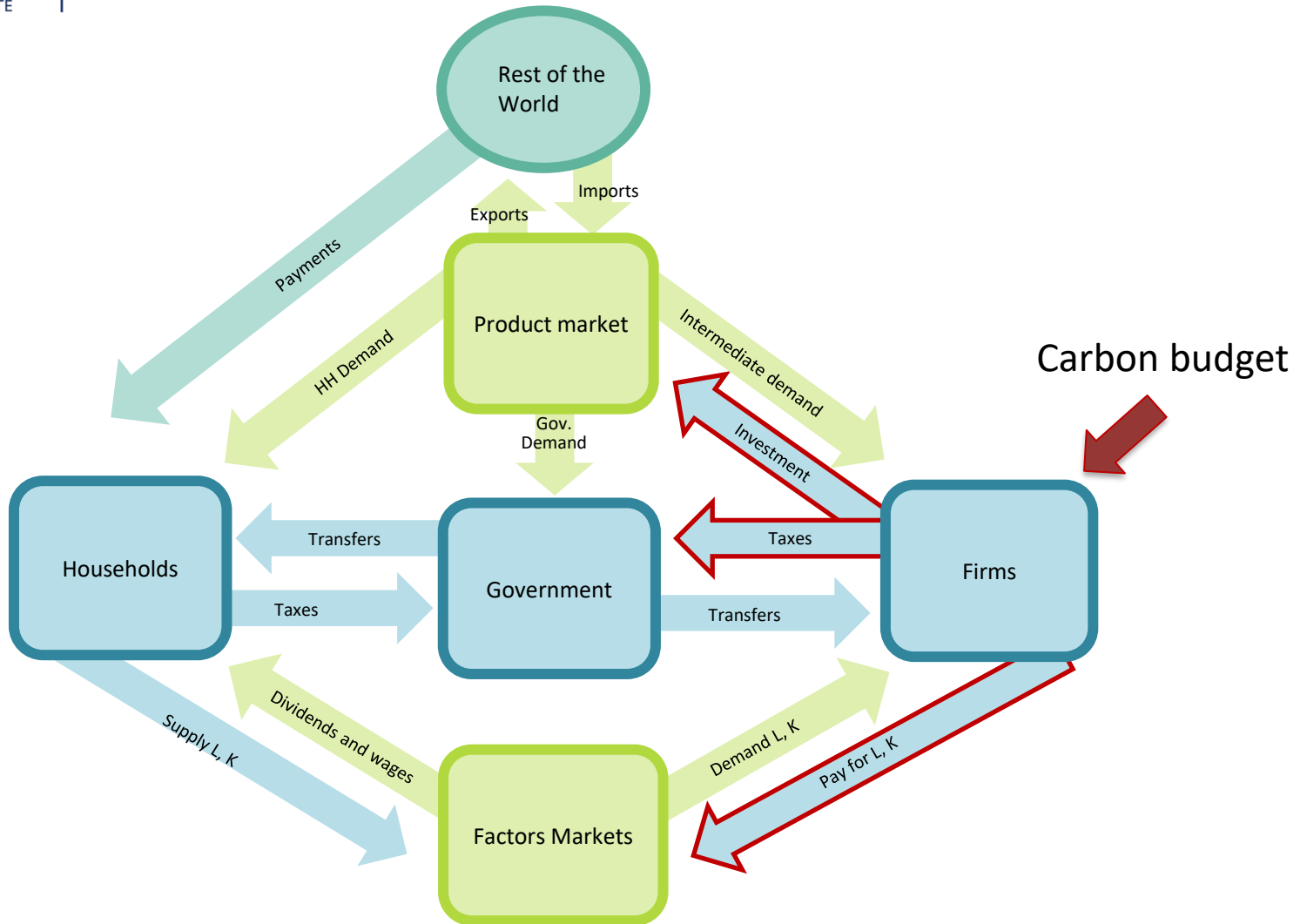
- Represents the interactions in the Economy
- Prices adjust and drive behaviour



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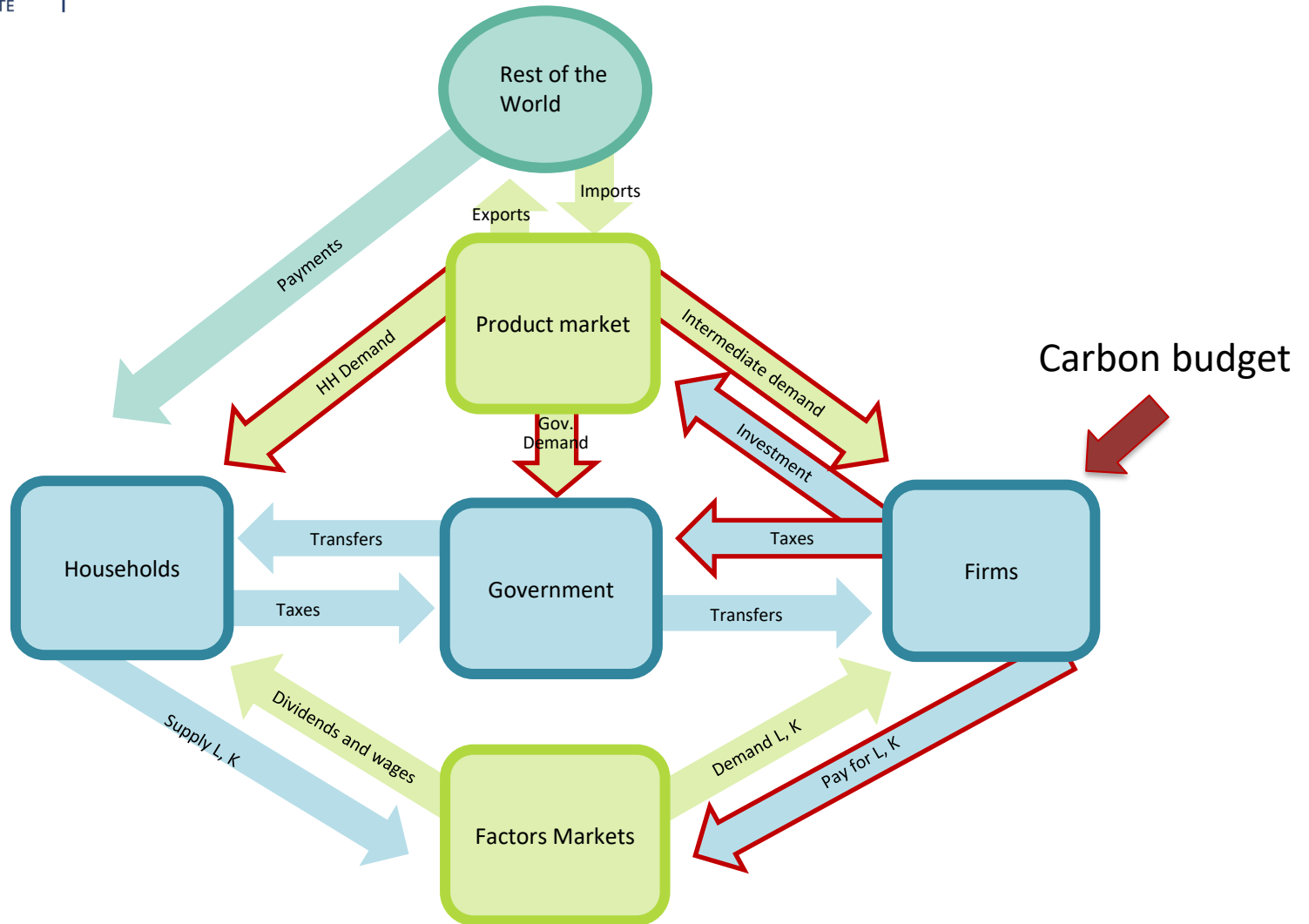


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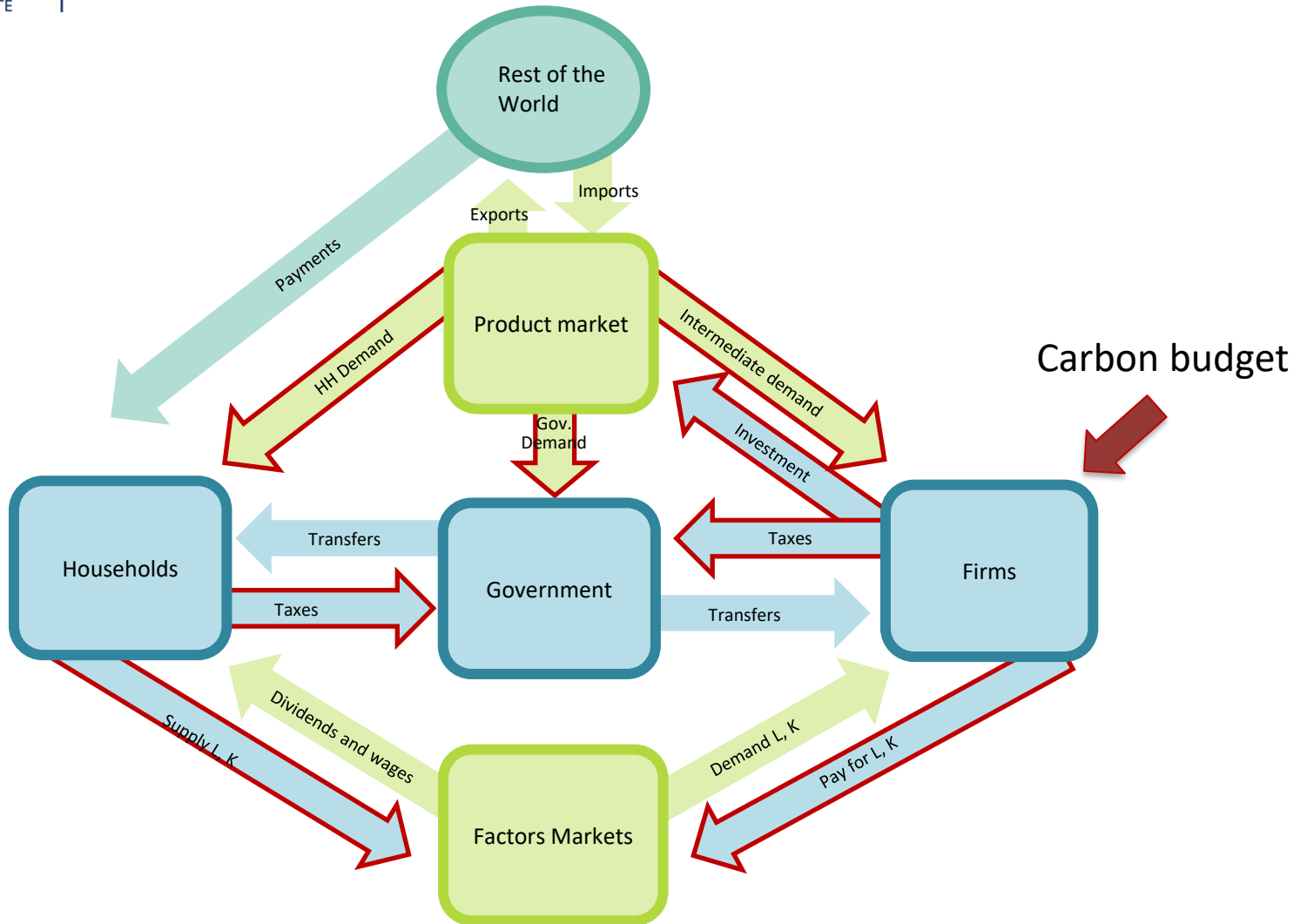




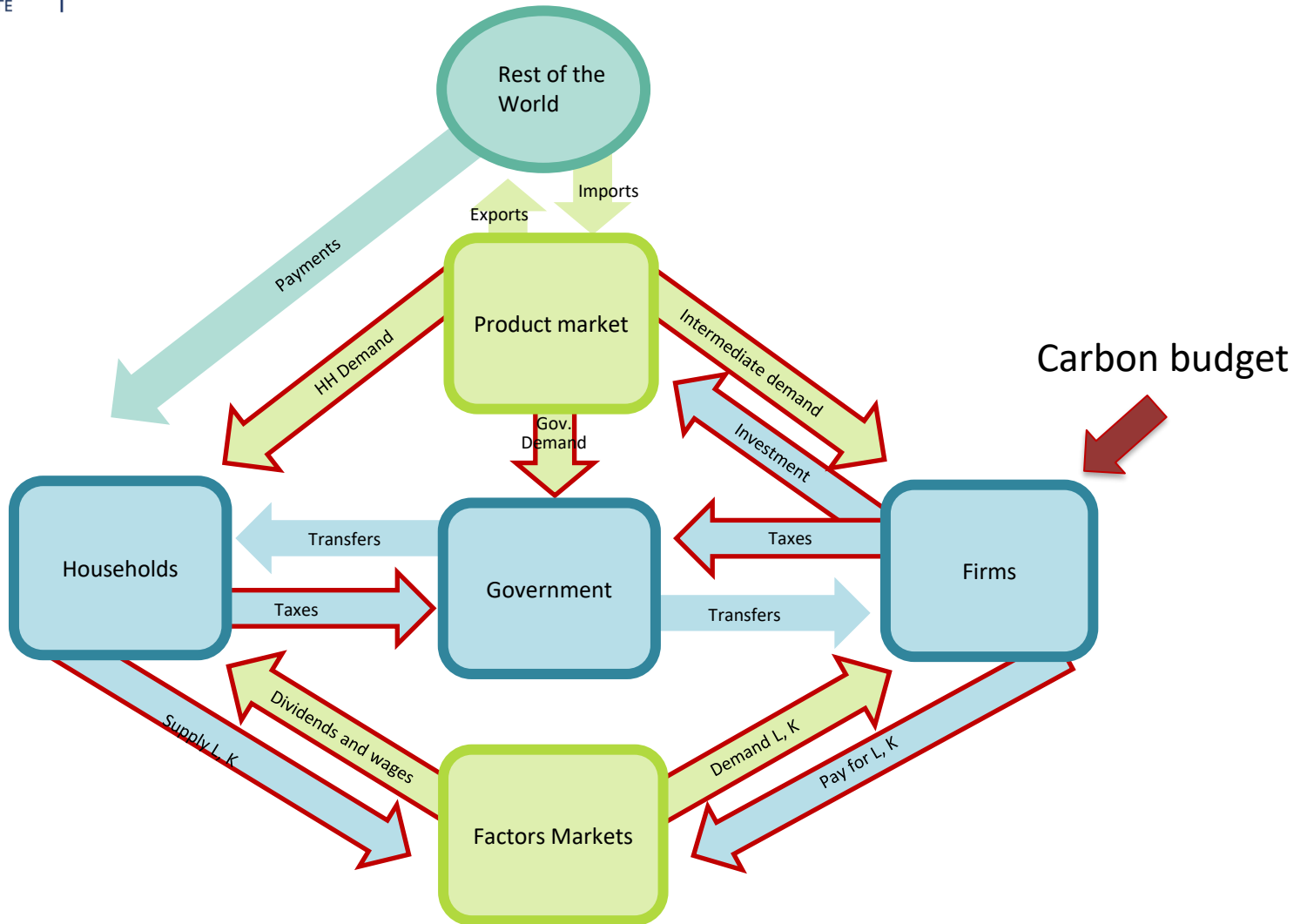
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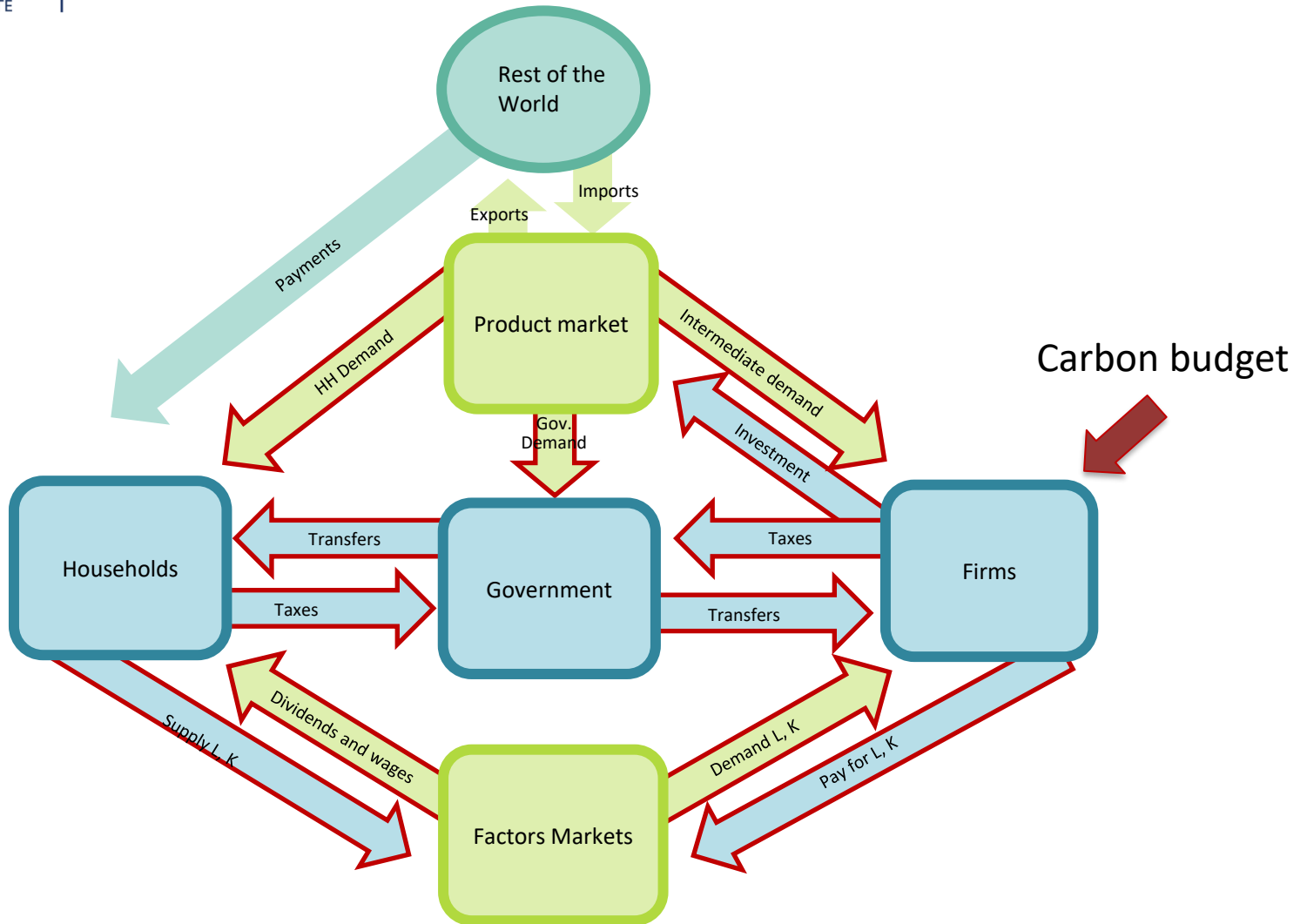
# I3E overview



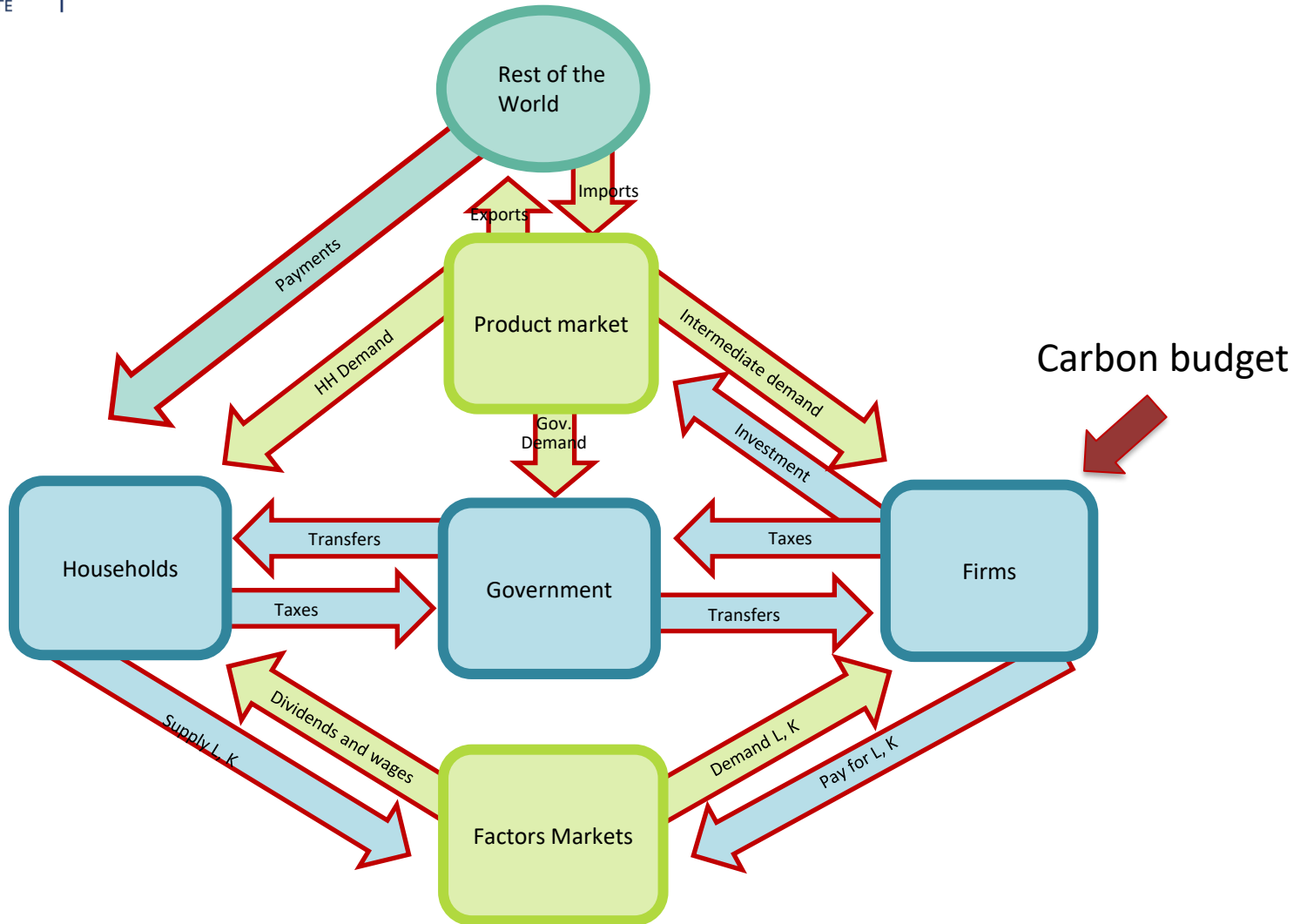
# I3E overview



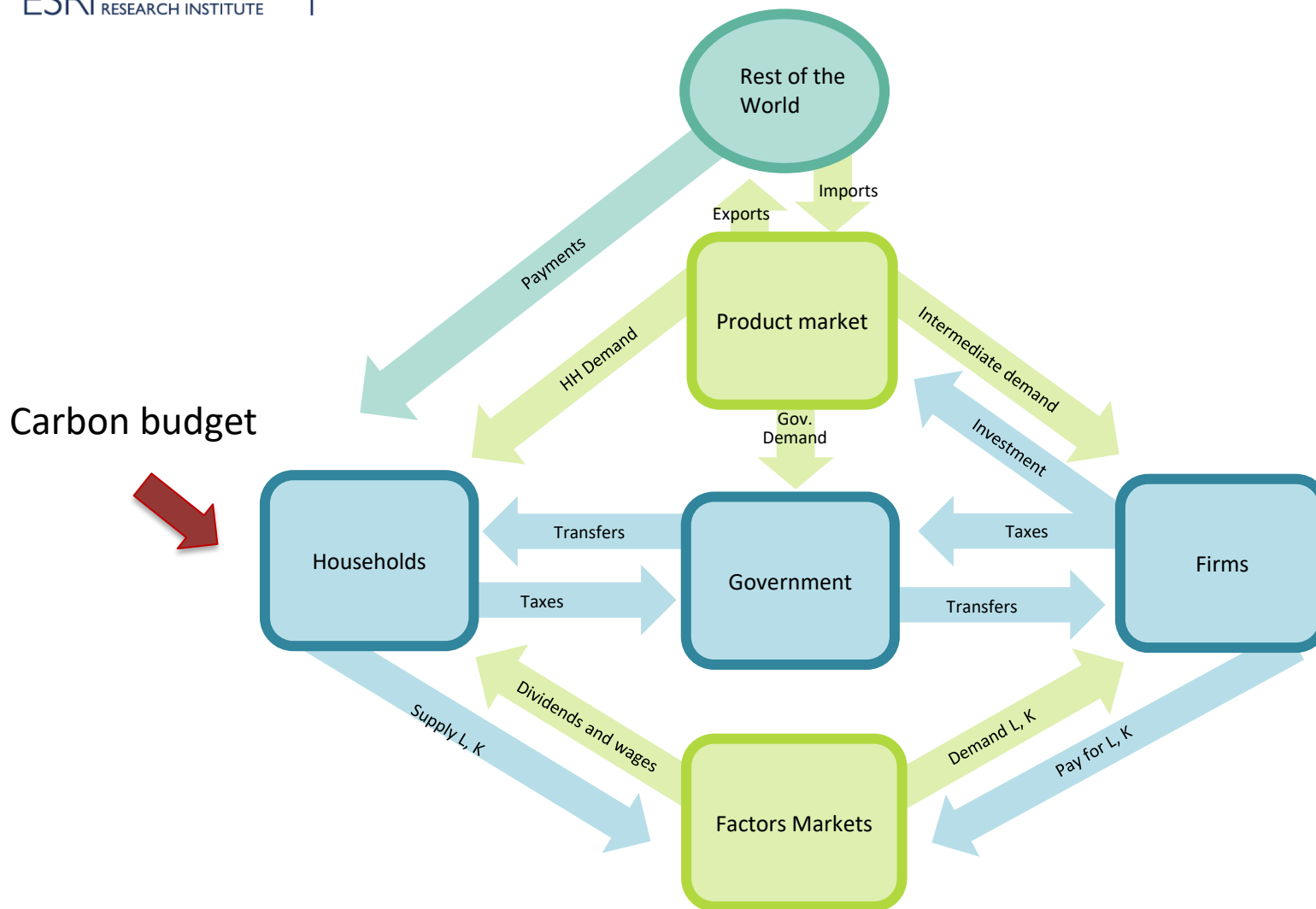
# I3E overview



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# Development Plan

- Update base year
- Incorporate better representation of costs of switching to low carbon
- Linking to TIM model, micro simulation and transport models
- Incorporate transition options

# Cooperation

- DECC CAMG
- Department of Taoiseach Modelling Group
  - Sub group on macro-economic modelling