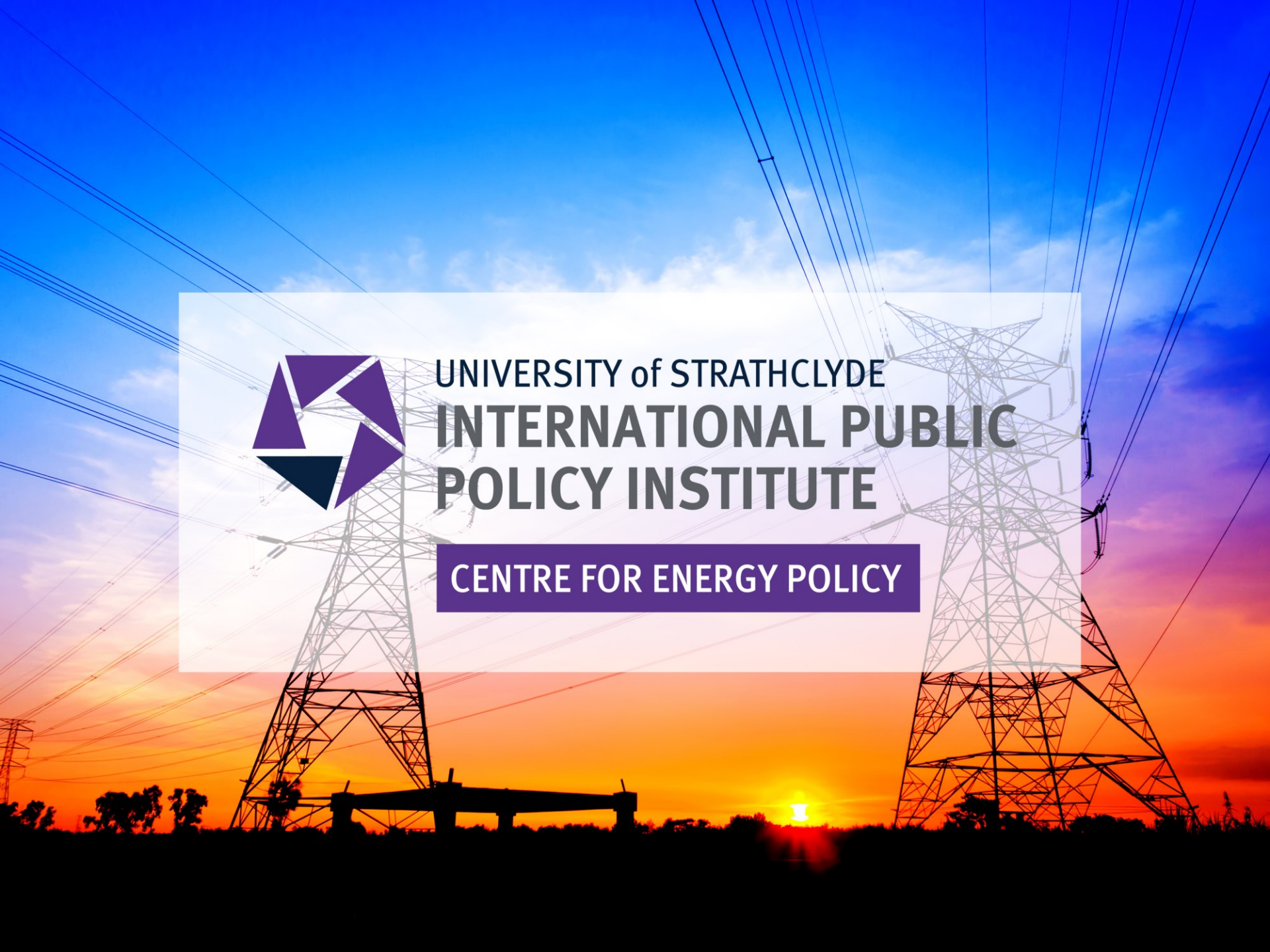
UNIVERSITY of STRATHCLYDE
INTERNATIONAL PUBLIC POLICY INSTITUTE
CENTRE FOR ENERGY POLICY

UNIVERSITY of STRATHCLYDE
INTERNATIONAL PUBLIC POLICY INSTITUTE
CENTRE FOR ENERGY POLICY

EPSRC EUED project 'Energy saving innovations and economy-wide rebound effects'

Rebound effect? Economic responses to increased energy efficiency reduce *actual energy savings* relative to *potential* from a engineering perspective

Economy-wide rebound? Consider AES impacts across all sectors

Project partners: EUED CIED centre at Sussex and Fraser of Allander Institute; external collaborators on different WP

Research Councils UK Energy For a Low Carbon Future

FRASER OF ALLANDER INSTITUTE

Centre on Innovation and Energy Demand

UNIVERSITY of STRATHCLYDE
INTERNATIONAL PUBLIC POLICY INSTITUTE
CENTRE FOR ENERGY POLICY

Key result – decoupling economy-wide rebound and economic expansion

- Household consumption function with public vs. private transport decision
- Increase energy efficiency in Road and Rail public (and freight) transport sector
- The more households respond to change in relative price/attractiveness of public over private options that may result from energy cost savings
- Economy-wide rebound reduced while retaining macroeconomic benefits
- Key – ***composition*** of household transport activity
- Dematerialisation agenda – focus on efficiency of delivery (and use) of energy (using) ***service*** options to deliver low carbon expansion
- Breakthrough area in rebound research – joint paper forthcoming with Lisa Ryan (University College Dublin, IEA Multiple Benefits project)

WP2 – Developing the model database and extending to international supply chains

UNIVERSITY of STRATHCLYDE
INTERNATIONAL PUBLIC POLICY INSTITUTE
CENTRE FOR ENERGY POLICY

Rebound re-stated as energy/carbon savings multiplier

- WIOD input-output database
- Focus on quantity adjustments in energy supply chains underlying ***negative rebound*** effects
- Use of multiplier analysis to consider UK and international energy use and carbon impacts of different spending allocations
- WIOD permits ***full 'carbon footprint'*** analysis with impacts broken down by industries within countries

- Policy brief – focus on ***restating rebound*** in terms of initial ***energy/carbon savings multiplier*** that is then eroded (but not wiped out) by positive rebound effects
- Initial Scottish work – focus only on Scottish GHG emissions

WP3 – Exploring the implications of improving the specification of the energy sector in the model

UNIVERSITY of STRATHCLYDE
INTERNATIONAL PUBLIC POLICY INSTITUTE
CENTRE FOR ENERGY POLICY

Energy supply response to increased efficiency in use

- Key results from previous research – capacity decisions in energy supply not limited to quantity adjustments above
- 'Disinvestment' effect dampens rebound over time
- Response to changing revenue and return on capital
- But now examining more closely previous assumptions of price taking and smooth adjustment of capacity
- Ultimately, possible interaction with **TIMES model**
- ***CGE informs TIMES*** about ***changes in demand*** following an efficiency improvement
- ***TIMES informs CGE*** about nature of ***energy supply curve***
- CGE informs TIMES about resulting impacting on demand across economy…..and so on

WP4 – Modelling energy savings and rebound effects following energy efficiency improvements by households

UNIVERSITY of STRATHCLYDE
INTERNATIONAL PUBLIC POLICY INSTITUTE
CENTRE FOR ENERGY POLICY

Energy efficiency in service delivery, household income and fuel poverty impacts

- How do energy efficiency improvements happen?
- Focus initially on private transport
- Increase in efficiency resulting from (investment in) and use of fuel in a more energy efficient car

- Impacts of energy efficiency improvements in different household income groups?
- More energy intensive households – bigger income effects, bigger rebound
- Different households use different types of fuels with different intensities – electricity/gas vs. refined fuel use
- Importance of energy supply response

UNIVERSITY of STRATHCLYDE
INTERNATIONAL PUBLIC POLICY INSTITUTE
CENTRE FOR ENERGY POLICY

Energy efficiency on production side of economy

- Previous work for UK (DEFRA, EPSRC and ESRC projects) and Scotland (Scottish Government 2007)
- Nature of expansion and rebound from energy efficiency improvements in different types of production sectors
- Importance of supply conditions in general (including energy supply)
- International focus and collaborations
  - German industry/global rebound work published in *Energy Economics* (Koesler)
  - Current Italian case study work (Giovanni Mandras, Sassari)
- Focus on introducing econometric specification of structure and parameters of production functions
- And lessons on energy supply from WP3

UNIVERSITY of STRATHCLYDE
INTERNATIONAL PUBLIC POLICY INSTITUTE
CENTRE FOR ENERGY POLICY

Knowledge exchange and impact of the research

- Talking to people about focus and design of current research
- How can we have real impact with outcomes of research at Scottish, UK, EU and wider international levels
- Impact in terms of informing policy analysis and decision making
- And also future research and knowledge exchange activity
- Not just in our area of modelling – throwing up issues and questions that will involve other types of modelling, research methods, multi-disciplinary activity

- ***Current project has UK-focus – where do we want to take it, and how, for Scotland?***

UNIVERSITY of STRATHCLYDE
INTERNATIONAL PUBLIC POLICY INSTITUTE
CENTRE FOR ENERGY POLICY

Contacts, web-sites

Contact: karen.turner@strath.ac.uk; antonios.katris@strath.ac.uk (first points of contact for wider team, including Grant Allan, Peter McGregor and Kim Swales, FAI)

EPSRC project web-site (including Policy and Research Briefing downloads):
http://cied.ac.uk/research/impacts/energysavinginnovations

CEP web-site: http://www.strath.ac.uk/ippi/aboutus/centreforenergypolicy/

IPPI policy papers: http://www.strath.ac.uk/ippi/ourpolicypapers/