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# Current research related to climate change

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- Mathematical simulation model; consistent with neoclassical economic optimisation theory; dynamic model (examine policy induced deviations on a yearly basis)
- Presents an evaluation of the economic costs for the Spanish economy in order to meet agreed objectives (e.g., Kyoto, 20/20/20) for greenhouse gas (GHG) emissions reductions
- Model results present an array of macroeconomic, microeconomic and environmental indicators. Sector coverage is detailed – covers 28 agricultural sectors; 112 sectors in total. Potential to examine the impacts on household income distribution in Spain
- Flexibility to incorporate different emissions reduction scenarios, as well as additional productivity shocks designed to capture adaptation strategies in different agricultural sectors
- Examination of ‘double-dividend’ approach (two objectives – one additional (environmental) policy tool). In agriculture, extend this principle to estimate a ‘cost neutral’ transfer payment for farmers.

# Modelling tools

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## Computable general equilibrium (CGE) models:

- Multi-regional (e.g., GTAP-E, EPPA-MIT, OECD-GREEN); national y regional (e.g., MMRF Green (Australia))

## Inputs:

- Accounting data (e.g., *inter alia* input-output, household budget survey, labour occupation data, government expenditure and incomes etc.) for the Spanish economy.
- Macroeconomic and sector specific projections.
- Elasticities to characterise economic agents (consumers, producers, investors etc.)
- CO<sub>2</sub>e emissions data for the 'basket' of 6 gases linked to appropriate 'drivers'

## Results:

- Macroeconomic impacts (GDP, employment, RPI, trade), microeconomic impacts (prices, quantities) and environmental policy impacts (marginal abatement costs, emissions reductions by sector)
- Utility (real income) impacts on households by income.

## Limitations

- Better understanding of technological adaptation options in **Spanish** agricultural sectors – improve the calibration of 'realistic' marginal abatement cost curves (preferably by gas type)
- Account for productivity changes in **Spanish** agricultural activity related to temperature changes

# Themes, WPs in FACCE-JPI

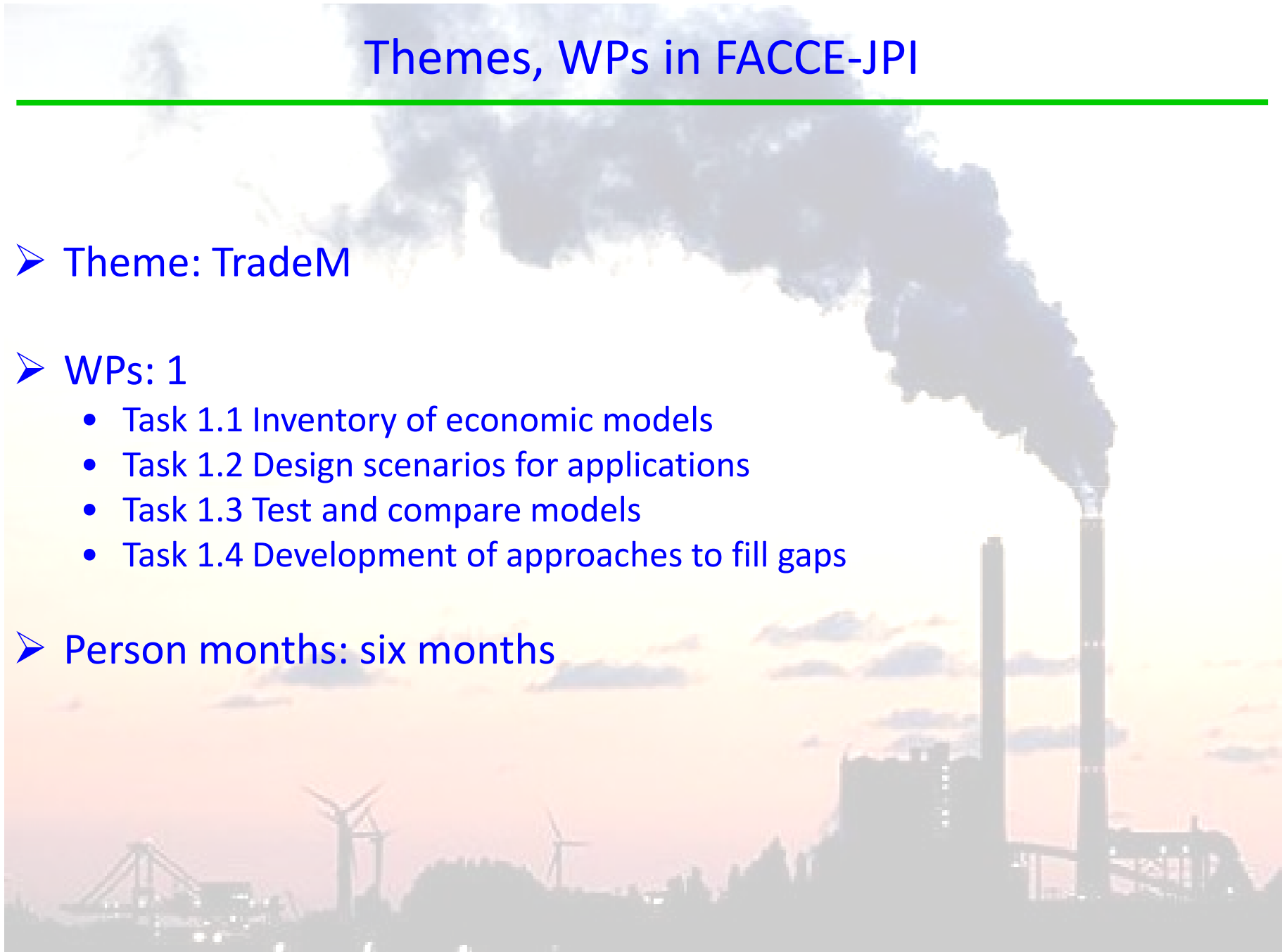
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➤ Theme: TradeM

➤ WPs: 1

- Task 1.1 Inventory of economic models
- Task 1.2 Design scenarios for applications
- Task 1.3 Test and compare models
- Task 1.4 Development of approaches to fill gaps

➤ Person months: six months



# Objectives within FACCE-JPI

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- Contact groups for the purposes of:
  - ✓ Collaborating with other economic modellers (both in Spain, the Mediterranean and Europe) to better understand the state of the art in environmental modelling techniques
  - ✓ Receiving expert guidance and best practise on improving the biophysical content within an economic framework (adaptation technologies and marginal abatement costs; agricultural productivity under different climate change scenarios). Better inform crop and livestock experts on the requirements of economic models

## Expected outputs:

- ✓ Engage in multidisciplinary collaborative efforts with crop and livestock experts with a Mediterranean specific emphasis, with a view to publish peer reviewed work
- ✓ Participate in multidisciplinary EU/National funded project bids