**Flagship: Next generation of IAMs to ethically inform decision support**

The main goal of our research group is to design robust climate governance interventions that ensure a fast, feasible and fair transition to a global carbon-neutral and climate-resilient society. To do so, we plan to improve the large computational models, called Integrated Assessment Models (IAMs), that quantify future climate-economic scenarios and shape the current discussion on the global response to climate change. These models capture essential relationships between environmental systems, economic actors and energy technologies. Nonetheless, their assessment is vulnerable to potential blind spots due to neglected modelling of deep uncertainties, non-linear dynamics, conflicting societal objectives, policy realism and complex actors interactions. This flagship plans to address these key blind spots by leveraging a wide range of approaches, including hybrid simulation-optimization schemes, multi-objective and stochastic optimization, adaptive pathways, multi-scale and multi-sector model coupling, data-driven learning and uncertainty-oriented analysis. Our team will explore the benefits of applying and advancing these techniques within our varied expertise on climate mitigation, adaptation, human behaviour, societal development trade-offs, decision-making under deep uncertainty, energy transition, tipping points and ethics. By developing and integrating new critical elements in IAMs, we can push the frontier of model-based decision-making for climate action and deliver the next generation of IAMs.

**About Giacomo Marangoni**

Giacomo Marangoni is Assistant Professor in the Multi-Actor Systems department at the TPM faculty. He has developed and used IAMs for over ten years, publishing numerous articles on multi-objective optimization and uncertainty analysis of mitigation strategies, the feasibility of clean energy transition, energy conservation, technological learning, and climate inequality. Withing his Climate Action Flagship, he is further researching how to design robust model-based climate policies, properly accounting for non-linear socio-technical processes, tipping point dynamics, conflicting environmental and economic objectives, ethical concerns and deep uncertainties.

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**PhD open positions**

PhD Position - Analysis of Socio-technical Tipping Points in Integrated Modelling for Climate Policy (closes 18-06-2023)