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Delivering on the Paris Agreement in a fragmenting world

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Energy transitions following the Ukraine invasion: insights from Italy and Greece

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REPowerEU strategy:

- urgently reduce dependency on Russian natural gas
- achieve affordable, reliable, and sustainable energy for Europe

Why Italy and Greece?

- natural gas dominates their electricity supply (~50% in Italy, ~40% in Greece)
- Both countries import more than 40% of their natural gas from Russia
- Energy affordability is a key concern in both countries









Navigating through an energy crisis

Challenges and progress towards electricity decarbonisation, reliability, and affordability in Italy

- We investigate Italy's progress towards
 SDG7, in light of the current energy crisis
- We asked experts to evaluate the impacts of key policies and uncertainties using fuzzy cognitive maps









- **Eight policies** (Italy's climate strategy • and energy response to Ukraine)
- Objective: progress to SDG7 ٠



- From policies to objective: **19 system** • components
- Shocks: 4 uncertainties. •

Italy: Simulation & Results (strategies)





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Regulatory & political environment stability





Citizen awareness & engagement

Technological costs



FCM results for the implementation of each policy strategy under uncertainty relative to a no policy – no uncertainty scenario

International conflict & price shocks



Electricity System Decarbonisation Electricity System Reliability Electricity System Affordability
 Progress on SDG 7







Transitioning amidst an energy crisis

A stakeholder-informed modelling study for Greece: the role of natural gas and climate ambition

- Soaring fossil-fuel prices throughout 2022
- Greece still plans to use gas as transition fuel
- Heavy investments on LNG





Greece: Role of gas in Climate Law





Electricity Generation from natural gas (Climate Law)

Increase of gas-powered electricity generation by 50% by 2030



Greece: High ambition scenario









Greece: Stakeholder top concerns







- Most pressing concern: energy crisis persisting
- Fossil fuel lock-ins, lack of geothermal energy, social opposition to new RES important bottlenecks





Greece: Reruns



- High ambition scenario: still feasible against uncertainties
- Also: much better response to price shocks compared to Climate Law
- However: higher shares of expensive technologies as well as lignite







Greece

- Current policies increase gas use by 50% in 2030 (relative to 2022)
- Ambitious RES strategy:
 - reaches complete independence from Russian gas by 2026
 - penetration of new and expensive technologies (but cost for citizens much lower in the longer run)
- Diversified renewable mix robust to technical constraints

Italy

- RES diffusion preferred over new gas infrastructure
- Policies promoting renewables:
 - more robust against uncertainties
 - could tackle affordability challenges
- Solely urging citizens to reduce demand may not drive SDG7 progress in the longer run





Thank you!

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