# The impacts of energy and environmental policies on the low-carbon transition of Mediterranean countries

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# Background*

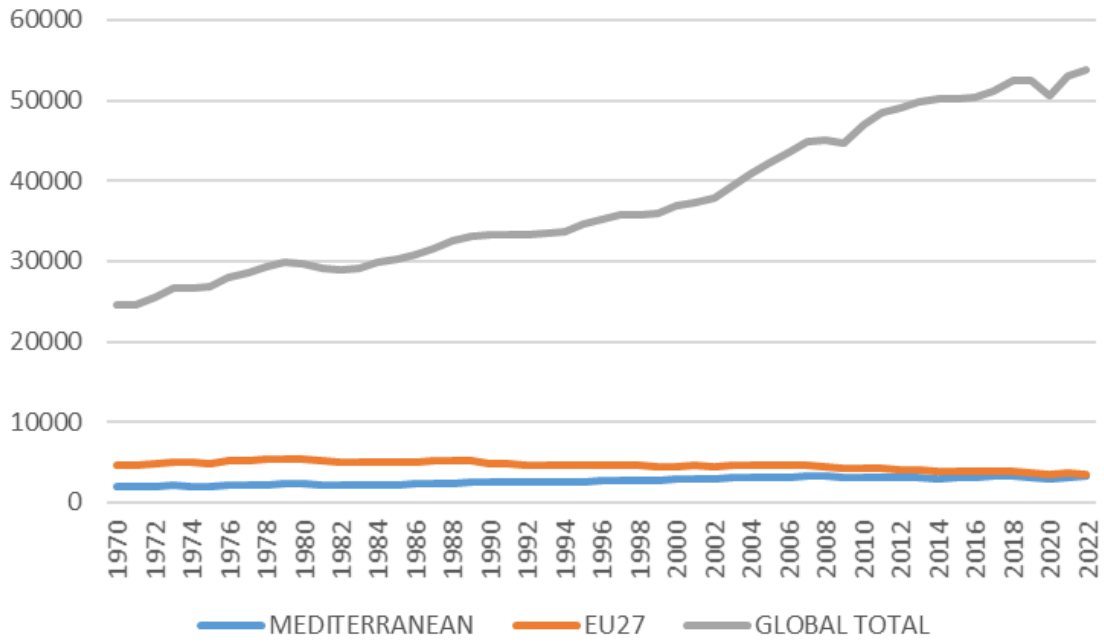
- Fossil fuels: the leading cause of increasing greenhouse gas (GHG) emissions
- Governments have increasingly provided direct support for fossil fuels as well as tax incentives
- On the other hand, they implement a couple of environmental policies that aim to correct for the effects of fossil fuel production/consumption and/or mitigate GHG emissions

***This is part of a study produced for Plan Bleu, not yet published, and will be part of an upcoming edited volume on Environmentally Friendly Economic Tools and Finances.***

# The problem addressed today

- The current trajectory of emissions has been a result of a combination of various policy tools such as taxes, subsidies, grants, loans, tax exemptions or reductions, financial instruments, and regulations.
- Conversely, a shift towards sustainable practices is also achievable through a range of policies and strategies.
  - **Green finance** represents one of these strategies aimed at facilitating the transition to a low-carbon economy.
- I will try to summarize the climate change implications of several environmental and energy policies utilized in Mediterranean countries:
  - FFS
  - Environmentally related taxes
  - FiTs

# Figure 1. GHG emissions by region (Mt $CO_2e$/year)




Source: Author's illustration using IEA- EDGAR (2023) data

# Policies

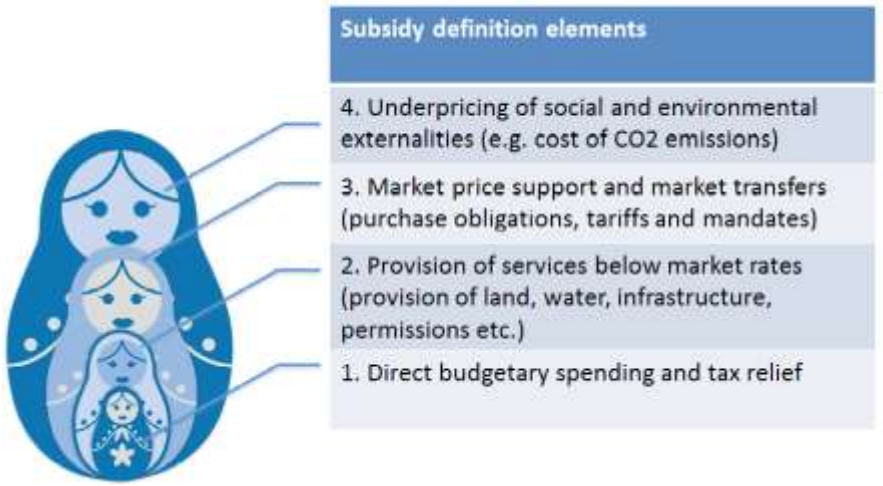
**Fossil fuel subsidies (FFS)** are defined as

budgetary transfers and tax expenditures that provide a benefit or preference for fossil-fuel production or consumption (OECD). ***FFS Mechanisms:***

1) **Direct budgetary transfers**: payments made by governments, or bodies acting on behalf of governments, to individual recipients. This includes direct spending, e.g. for specific support programmes, and government ownership (fully or through equity shares) of energy-related enterprises.
2) **Tax expenditures**: tax concessions that are typically provided through lower rates, exemptions, or rebates of consumption taxes on fossil fuels (mainly value-added taxes and excise taxes) or measures to reduce the cost of the extraction of fossil fuels.

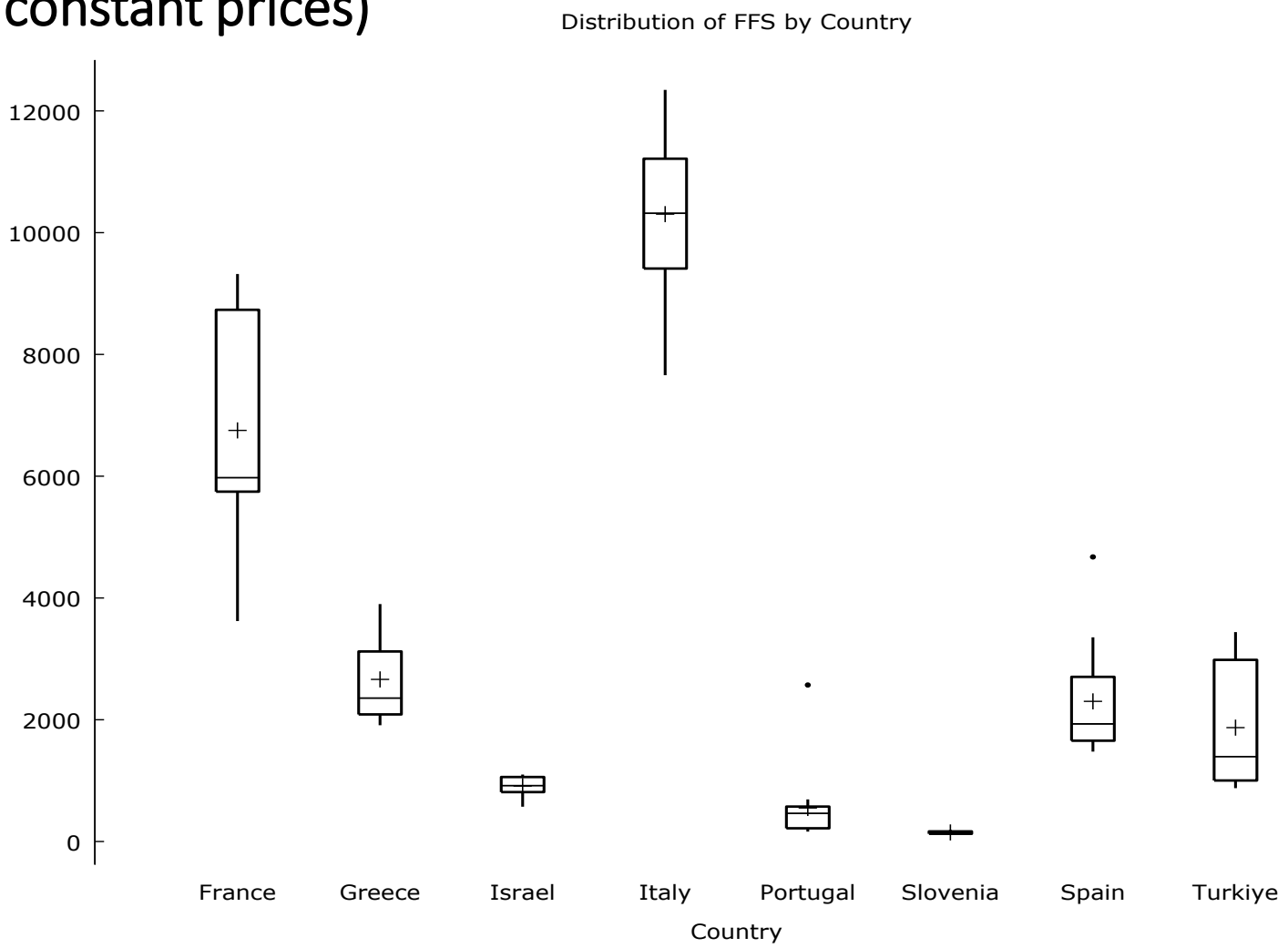
The OECD Inventory of Support Measures for Fossil Fuels reports that direct transfers and tax expenditures associated with support measures for fossil fuels amounted to USD 427.9 billion in 2022.

IEA estimates that fossil fuels sold below market prices amounted to USD 1,126.6 billion in the same year.




**Source: The IISD Global Subsidies Initiative**

# Figure 2. Distribution of FFS by country in the Mediterranean (million USD, constant prices)




Source: Author's illustration using OECD data

# Policies

**Environmentally related taxes** are constructed by

1) focusing on taxes on GHG emissions from different activities by splitting tax revenues into two subcategories: the energy-related part (recorded as an energy tax) and the non-energy-related part, such as certain GHG emissions from landfills or agriculture (recorded as a pollution tax), and

2) introducing four "memo items" to enhance the relevance of the accounts for policy work:
(i) certain land taxes, (ii) taxes on oil and natural gas extraction, (iii) taxes on the resource rent (profit taxes only) and (iv) elevated VAT levied on environmentally related tax bases (OECD, 2023).

As of 2019, Croatia, Slovenia, and Greece were the leading countries in terms of the proportion of their GDP allocated to environmental taxes.

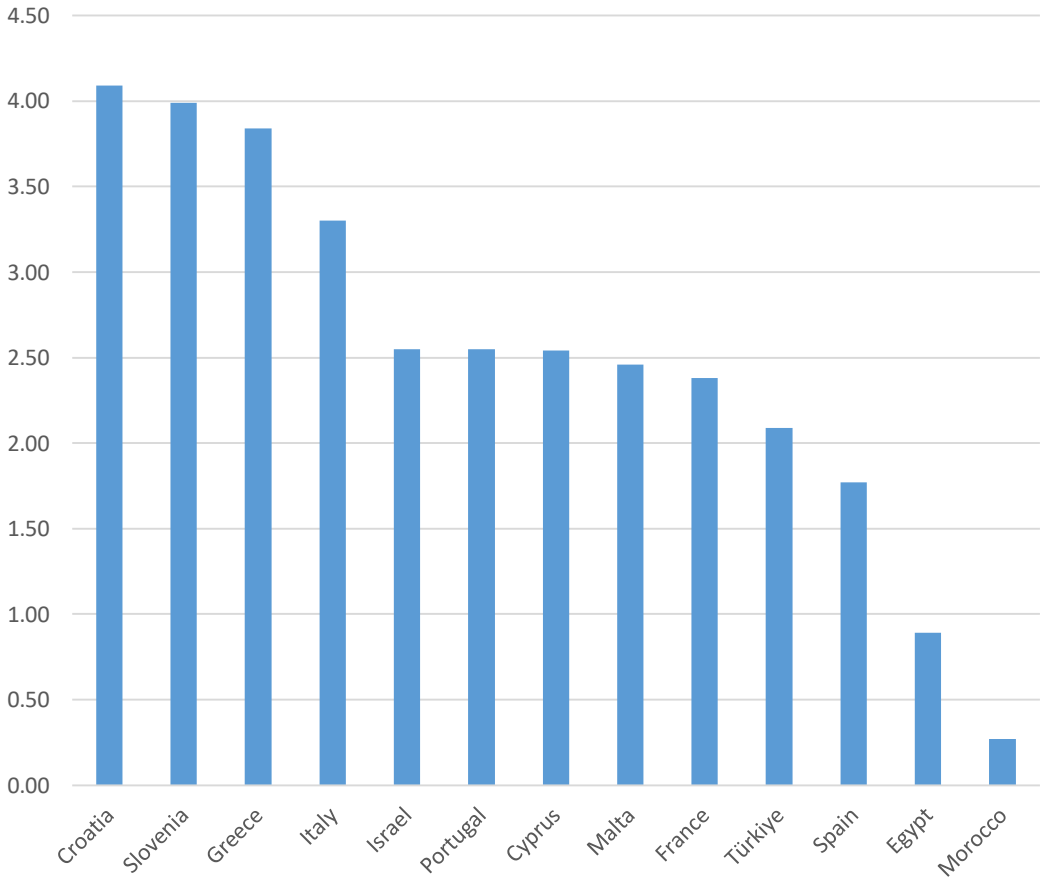
**FiTs** are widely used policies designed to promote the expansion of renewable electricity capacity.

These market-driven economic tools generally provide long-term agreements that ensure a fixed price per kilowatt-hour (kWh) for electricity supplied to the grid from a specified energy source.

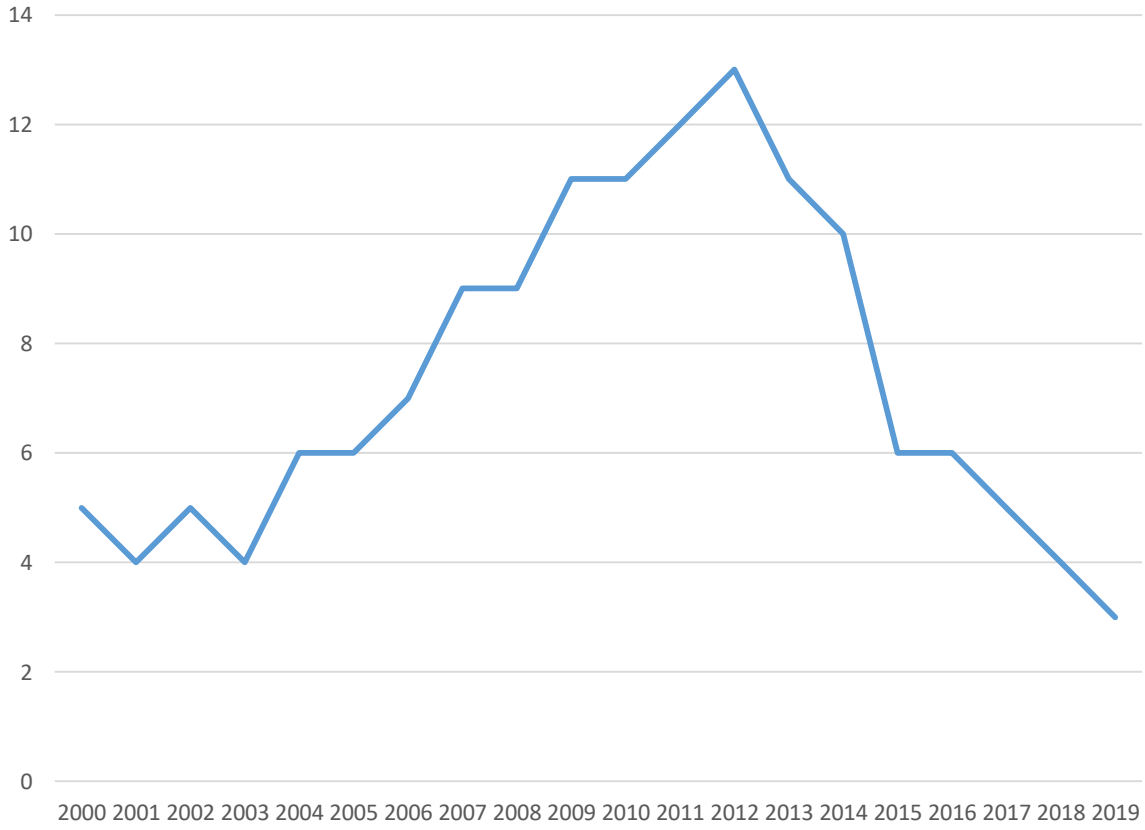
OECD (2022) reports both the mean FiT prices (in USD) and the length of power purchase agreements (in years) for each renewable source supported. The length of agreements ranges between 10 and 25 years.

In the Mediterranean region, almost every country has implemented a FiT policy, except Malta and Morocco.

# Figure 3. Environmental taxation (% of GDP) in the region, 2019



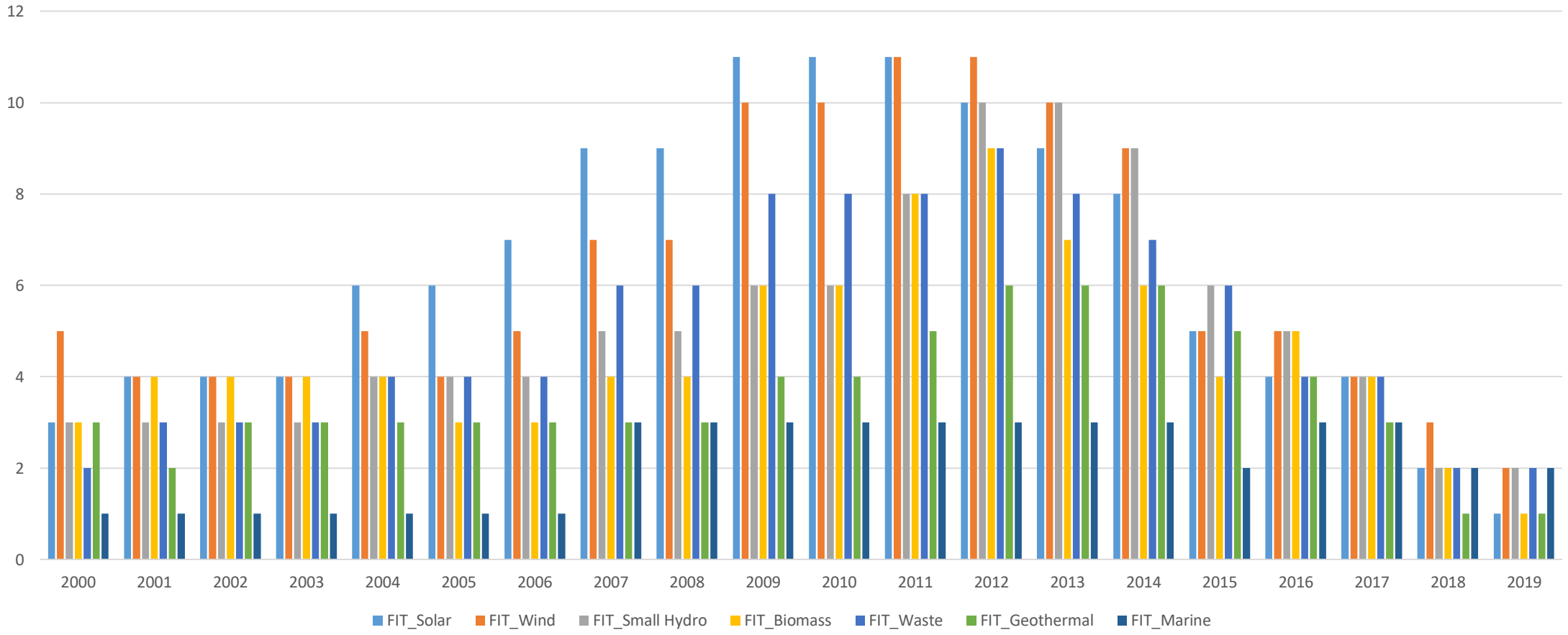

# Figure 4: Number of countries adopting FiTs in the region




Source: Author's illustration using OECD data

# Figure 5: Number of countries with FiTs with respect to source

The peak year for adopting FiT schemes across all these energy sources was 2012. During that year, 10 countries implemented FiT schemes for solar, 11 for wind, 10 for small hydro, 9 for both biomass and waste, 6 for geothermal, and 3 for marine resources. Over time, FiTs for nearly all renewable energy sources saw a decline in popularity.




Source: Author's illustration using OECD data

# The methodology employed

Aim: To detect the causal relationship between each of these policies and per capita GHG emissions, for the period 1994-2022, using panel data analysis.

The model can be expressed as follows:

$$y_{it} = \alpha + X_i'\beta + u_{it}$$

In this formula, for *i= 1,..., N* and *t= 1,..., T*, where $y_{it}$ is the dependent variable, $X_i'$ is the vector of independent variables, $\beta$ is the coefficient vector of independent variables, and $u_{it}$ is the composite error.

# Results

- **FFS** have proven to be detrimental by leading to an increase in GHG emissions in the region thereby bearing a cost on the attempts to mitigate climate change.
  - The most harmful types occur to be FFS to producers (by beneficiary) and to gas (by energy source).
  - There is no FFS category that proves to be beneficial for climate mitigation.
- **Environmental taxation** is an effective tool to accelerate the low-carbon transition **if policy is stringent**.
  - Taxation alone cannot fully address the structural and behavioral changes needed for a low-carbon economy without complementary measures like subsidies, infrastructure investments, and stringent regulations.
  - It can be an effective tool only if environmentally related tax proceeds are earmarked for environmental purposes such as climate mitigation and adaptation.
- The implementation of **FiTs** does not always guarantee the acceleration of a low-carbon transition.
  - FiTs to hydro, waste, and marine power work well in some countries in the region.
  - Where solar, wind, and geothermal replace carbon-intensive energy sources, such as natural gas, FiTs to them can work well; otherwise, they don't fully offset fossil fuel dependency.

# Synthesis of the policy measures under scope (Acar, 2025)

| Policy Tool/Instrument | Evaluation | Reasoning |
|---|---|---|
| **Environmental Taxation** | Good | Promotes resource efficiency, fosters climate mitigation, encourages innovation, and targets high-emissions sectors effectively if well-designed and policy is highly stringent. |
| **Feed-in Tariffs (FiTs)** | Neutral | Can support renewable energy adoption but may fail without coherent energy policies or provisions prioritizing smaller producers/community-based projects. The impacts of FiTs to each renewable resource may differ depending on the country context. |
| **Other Subsidies for Renewable Energy** | Good | Supports the growth of infant renewable industries, aids the green transition, and fosters economic sustainability when designed effectively. |
| **Carbon Tax** | Good | Encourages emissions reductions by internalizing environmental costs, fostering a low-carbon economy, and driving innovation in green technologies. |
| **Subsidies for Fossil Fuels** | Bad | Anchors fossil fuels in the economic structure, hinders renewable energy development, and reduces fiscal space for green initiatives. |
| **Grants/Loans/Bonds for Green Transition** | Good | Targets high-emissions sectors like energy and transport, aiding the transition to a low-carbon economy. |
| **Energy Efficiency Investments/Incentives** | Good | Reduces energy consumption and emissions while creating economic savings and fostering sustainable development. |
| **Green Reporting and Transparency** | Good | Enhances monitoring of green finance, ensures accountability, and aligns investments with sustainability goals. |
| **Fossil Fuel Subsidy (FFS) Removal** | Good | Frees financial resources for green investments and supports climate goals, provided that mechanisms are in place to protect disadvantaged groups. |

# Policy implications and conclusions

- FFS need to be phased out.
- Revenues from FFS phase-out and environmental taxes can be strategically allocated to finance renewable energy projects, energy efficiency programs, sustainable infrastructure, and research and development in green technologies.
- Environmental taxes need to be designed in a way to target the most emissions-intensive sectors effectively instead of being broadly applied.
  - Climate taxes can support subsidies or grants for clean energy adoption, offsetting transition costs for businesses and households.
- When combined with stringent policies that focus on high-impact areas (e.g., heavy industry, transportation), the interaction may drive more substantial emissions reductions.

- FiTs can promote renewable energy production in an economic environment which also prioritizes a reduction in dependence on fossil fuels and reducing GHG emissions.
- When there are contradictory energy policies in place, FiTs may not end up with the desired outcomes they are meant to lead to.
  - On the one hand, subsidies to renewable energy can be justified as they support infant renewable energy industries in the early stages of their development and spread.
  - On the other hand, continuing to subsidize fossil fuels anchors them to the economic structure, hinders the development of renewable energy, and reduces the fiscal space available to support green technologies and mitigation actions.
- FiT policy needs to be designed to include provisions that prioritize smaller producers or community-based projects, and democratize energy production and distribution.
- If planned appropriately and coherently, FiTs can contribute to creating green jobs, thereby promoting economic growth that is compatible with environmental sustainability.

## TO SUM UP:

- **The necessity of a holistic program in financing the solutions to combat the climate crisis is clearly seen.**

*Thanks* ☺

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