

# What drives eco-innovation in Turkish SMEs?

Arslan Austin<sup>1</sup>   Sedat Alataş<sup>2</sup>   Darlington Agbonifi<sup>3</sup>

<sup>1</sup>Rhine-Waal University, Germany

<sup>2</sup>Aydın Adnan Menderes University, Türkiye

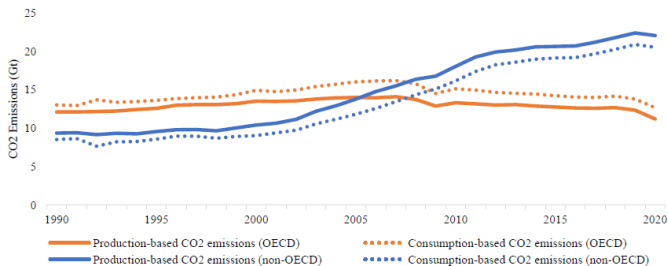
<sup>3</sup>University of Verona, Italy

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# COP29: Developing Countries and Climate Finance

- New Collective Quantified Goal on Climate Finance

Figure 1: Production- and Consumption-based Emissions (OECD vs. Non-OECD)

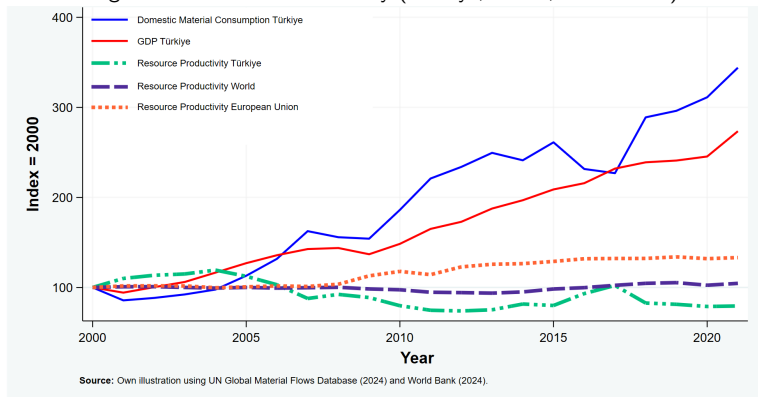


Source: Makarov ve Alataş (2024)

- Good news, yet not sufficient.

# Resource Productivity in Türkiye

Figure 2: Resource Productivity (Türkiye, World, and the EU)



Source: UN-GMFD (2024) World Bank (2024)

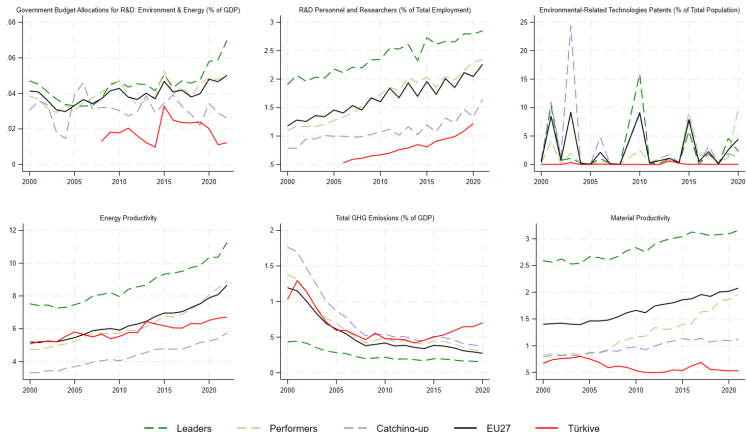
# Türkiye: Climate Targets and Mitigation

- Türkiye is the world's 14th largest carbon emitter.
- Türkiye set ambitious climate targets
  - The ratification of the Paris in 2021
  - 2053 net-zero target
  - The emissions reduction target has been updated from 21% to a 41%
  - Absolute reductions will start in 2038.
  - Policy documents and legislation on climate change
  - The 2053 long-term climate strategy announcement at COP29
- Türkiye's intention to fulfill the Paris Agreement goal is demonstrated by all of its targets and initiatives.
- Yet, they are not the unique factors that have contributed to Türkiye's setting of such climate goals.

# Türkiye and EGD

- EU introduced the EGD in 2019.
- Not only the EU members but any economy that has close ties to the EU, particularly emerging ones, is likely to be affected by this regulation.
- Türkiye will be more likely one of the most affected countries due to strong trade ties, especially since 1995 with the customs union trade agreement
- Two channels:
  - Circular Economy Action Plan: new material and energy efficiency standards
  - CBAM: pricing GHG emissions embedded in carbon-intensive products
  - For example, as of 2023, the EU countries account for approximately 41% of Türkiye's total exports.

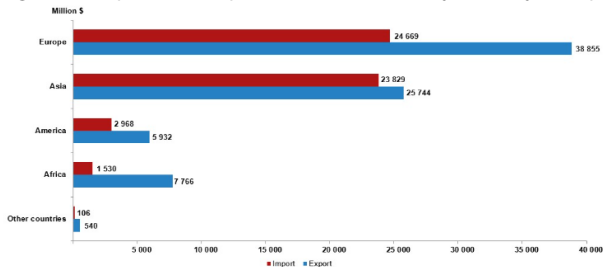
## Figure 3: EI in Türkiye and EU



Source: OECD (2024), Eurostat (2024), WDI (2024), UN-GMFD (2024)

# Turkish SMEs

Figure 4: Export and Import Values of SMEs by Country Groups



- 50% of total exports of Turkish SMEs are made to the European countries.
- SMEs made 45% of their imports from European countries.
- Turkish SMEs make up almost 30% of total RD expenditures. However, 56.4% of them still manufacture in the low technology class.
- The number of patent applications and registrations from SMEs is quite low.

# Main Purpose

- The main purpose of this study is to empirically explore the main drivers of eco-innovation in Turkish SMEs
- What drives eco-innovation in Turkish SMEs?
  - In cases where SMEs facing financial distress lack an effective platform for reorganization and restructuring and have sufficient access to bank financing, as in Türkiye or other typical emerging economies, what helps firms the most to be more resource efficient—internal (own finance or own expert) or external (bank finance, grants, or subsidies) sources?
  - What is the role of government grants and subsidies? Are they employed in a way that increases the firm's eco-innovative action?
  - What is the role of improved company-to-company collaboration, technology demonstrations, and funding opportunities in participating in eco-innovative action?



# Dataset

- EC (2022) Flash Eurobarometer 498, SMEs, Resource Efficiency and Green Markets, W5.
- EU-27 and eight other non-EU countries, including Türkiye and USA.
- From the total sample of 17,662 SMEs, we focus on 469 Turkish SMEs.
- The questionnaire defines EI broadly, thus offering the opportunity to understand the determinants of different actions (e.g., saving water, designing new products) that may lead to EI.
- We use a composite definition of EI and investigate what can lead to “many actions” of EI as compared to “few” or “no” actions.
- Probit model: To check for the robustness of the model, different tests (Linktest, log-likelihood ratio, and the Hosmer–Lemeshow) were conducted.

# Data: EI

EI	<p>Q: What actions are your company taking to be more resource efficient?</p> <ul style="list-style-type: none"><li>- Save water</li><li>- Save Use predominantly renewable energy (e.g. including own production through solar panels, etc.)</li><li>- Save materials</li><li>- Switch to greener suppliers of materials</li><li>- Minimize waste</li><li>- Sell your residues and waste to another company</li><li>- Recycle, by reusing material or waste within the company</li><li>- Designing products that are easier to maintain, repair or reuse</li><li>- None</li></ul> <p>Regrouped as within the data:</p> <ul style="list-style-type: none"><li>- Many actions</li><li>- Some actions</li><li>- Few actions</li><li>- No actions</li></ul>	<p>1 if Many actions &amp; Some actions; 0 otherwise</p>
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# Data: Drivers

Independent variables		
<i>Drivers</i>		
	Which type of support does your company rely on in its effort to be more resource efficient?	
Ownfinance	Its own financial resources	1 if mentioned 0 otherwise
Owntechexpert	Its own technical expertise	1 if mentioned 0 otherwise
ExtSupport	External support	1 if mentioned 0 otherwise
	Which of the following would help your company the most to be more resource efficient?	
AssesmentTool	A tool to self-assess how resource efficient your company is with respect to other companies	1 if mentioned 0 otherwise
Consultancy	Consultancy on how to improve resource efficiency in your company	1 if mentioned 0 otherwise
GrantsSubsidies	Grants or subsidies	1 if mentioned 0 otherwise
FinancialAdvice	Advice on funding possibilities and financial planning for resource efficiency investments	1 if mentioned 0 otherwise
Demonstration	Demonstration of new technologies or processes to improve resource efficiency	1 if mentioned 0 otherwise
Database	Database with case studies that show the benefits of resource efficiency for companies	1 if mentioned 0 otherwise
Cooperation	Better cooperation between companies across sectors so that new processes to re-use waste and by-products can be developed	1 if mentioned 0 otherwise
ClearRules	Clearer rules on the use of secondary raw materials	1 if mentioned 0 otherwise

# Data: Control Variables

Control Variables		
FIRMSIZE	How many employees (in full-time equivalents) does your company currently have? 1 to 9 employees 10 to 49 employees 50 to 249 employees 250 to 499 employees	1 if 50 to 249 employees 250 to 499 employees 0 otherwise
FIRMAGE	In what year was your company established? Before 1 January 2014 Between 1 January 2014 and 31 December 2016 Between 1 January 2017 and 1 January 2021	1 if Before 1 January 2014 0 otherwise
Sector specific effects Manufacturing Retail Industry Services	Yes	1 if mentioned 0 otherwise
B2C B2B B2G	Is your company selling its products or services...? Directly to consumers To other companies To public administration	1 if mentioned 0 otherwise

# Results I

Variable	Obs	Mean
Ecoinno	456	0.669
Ownfinance	456	0.711
Owntechexpert	456	0.412
ExtSupport	456	0.173
AssesmentTool	456	0.232
Consultancy	456	0.272
GrantsSubsidies	456	0.265
FinancialAdvice	456	0.305
Demonstration	456	0.344
Database	456	0.257
Cooperation	456	0.327
ClearRules	456	0.202

- Almost one-third of Turkish SMEs are not actively conducting EI.
- EI is mainly financed by own resources (71%) while the grants and subsidies are a reliable source of financing for only a quarter of SMEs (26%).
- Own technical expertise is somewhat utilized (41%), while external support is extremely less (17%).

## Results II

VARIABLES	(1) Coefficients	(2) Marginal Effects
Ownfinance	0.927*** (0.175)	0.263*** (0.0457)
Owntechexpert	1.001*** (0.173)	0.285*** (0.0436)
ExtSupport	0.902*** (0.228)	0.256*** (0.0626)
AssesmentTool	0.360** (0.160)	0.102** (0.0452)
Consultancy	0.138 (0.155)	0.0392 (0.0440)
GrantsSubsidies	0.143 (0.160)	0.0407 (0.0452)
FinancialAdvice	0.350** (0.150)	0.0994** (0.0422)
Demonstration	0.272* (0.144)	0.0774* (0.0405)
Database	-0.0313 (0.151)	-0.00890 (0.0428)
Cooperation	0.381*** (0.147)	0.108*** (0.0412)
ClearRules	0.344* (0.176)	0.0977** (0.0495)
MANU	-0.406* (0.215)	-0.115* (0.0593)
RETAIL	-0.467** (0.211)	-0.133** (0.0593)
SERV	-0.684*** (0.196)	-0.194*** (0.0542)
<u>o.IND</u>	-	-
FIRMSIZE	0.426*** (0.147)	0.121*** (0.0410)
FIRMGAGE	-0.454* (0.241)	-0.129* (0.0678)
B2C	0.163 (0.166)	0.0462 (0.0472)
B2B	0.185 (0.154)	0.0527 (0.0437)
B2G	0.0737 (0.181)	0.0209 (0.0515)
Constant	-0.734** (0.342)	
<b>Observations</b>	<b>469</b>	<b>469</b>
<b>r2_p</b>	<b>0.208</b>	

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# What to Do Next: Barriers

Q7 Did your company encounter any of the following difficulties when trying to set up resource efficiency actions?

(READ OUT - MULTIPLE ANSWERS POSSIBLE)

Complexity of administrative or legal procedures	1
Difficulty to adapt environmental legislation to your company	2
Technical requirements of the legislation not being up to date	3
Difficulty in choosing the right resource efficiency actions for your company	4
Cost of environmental actions	5
Lack of specific environmental expertise	6
Lack of supply of required materials, parts, products or services	7
Lack of demand for resource efficient products or services	8
Complexity associated with environmental labelling and certification	9
Other (DO NOT READ OUT)	10
None (DO NOT READ OUT)	11
Don't know/No answer (DO NOT READ OUT)	12

FI 456 - Q7 Modified

# The End

*sedat.alatas@adu.edu.tr*