Transitioning to a Clean Energy Growth Model: Challenges, Opportunities and Solutions

Ebru Voyvoda, METU and IPC

Multi-year Expert Meeting on Enhancing the Enabling Economic Environment at All Levels in Support of Inclusive and Sustainable Development, and the Promotion of Economic Integration and Cooperation

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The global economy and geopolitics are unsettled

(UNCTAD, TDR 2023)

- The growth rate of world economy in 2022 was 3.0%. **It is expected to go down to 2.4% in 2023**.
- **All regions** (except East and Central Asia) **are expected to grow at rates slower than 2022**, largest drop in Europe. The EU-27 2023 growth rate is expected to be 0.4%. The forecasted growth rates of 2023 and 2024 **are among the lowest in the last 4 decades** (outside crises years).
- Global trade in goods and **services is forecast to grow about 1 % in 2023**, significantly below world economic output growth. The **slowest average growth period for global trade since** the end of the Second World War…
- **Multi-dimensional crisis**: difficulty of meeting critical needs such as **food security, energy security, social protection, climate adaptation/mitigstion**. Inflation and debt stress, esp. in developing economies…
- **High uncertainties and risks**

Geo-strategic policy making, multi-polar order

- Re-thinking of the energy security, energy supply pathways…
- Re-shaping and geographical concentration of the value chains…
- Export restrictions on critical raw materials…

ADVANCED COUNTRIES

- Green and digital transition requiring rapid and drastic transformation of the economies
- (unfair) competition from China, Re-thinking state's role, Innovation drought
- **Revival of Industrial Policy**

USA: INVESTING IN AMERICA Agenda

Inflation Reduction Act – IRA (August 2022)

Creating Helpful Incentives to Produce Semiconductors – CHIPS & Science Act (August 2022)

Infrastructure Investment and Jobs Act (2021)

EU: EU GREEN DEAL AGENDA – "Open Strategic Autonomy"

Green Deal Industrial Plan

Net-Zero Industry Act

CURRENT DEBATE(S), Industrial Policy Documents - EU

- “preserving rightful place in the global pecking order”
- “domestic economic development”
- “importance of investing in technological sovereignty”
- dependence on imports for new clean manufacturing technologies”
- “long term economic prosperity and sovereignty”
- “industrial transformation at home”
- “path dependency of technological innovations”… hence “need for active industrial policy”
- hence “governments active involvement”…

Geo-strategic policy making, multi-polar order

- New challenges, necessities of cooperation and opportunities for developing countries
  - ✓Developmental discourse: link b/w **economic growth and structural transformation**

    [recognition that the necessary de-carbonization pathways will imply transformation of energy and production structures of the economies, and that **such transformation will force taking into account sectoral dependencies with respect to energy as well as other critical inputs]**

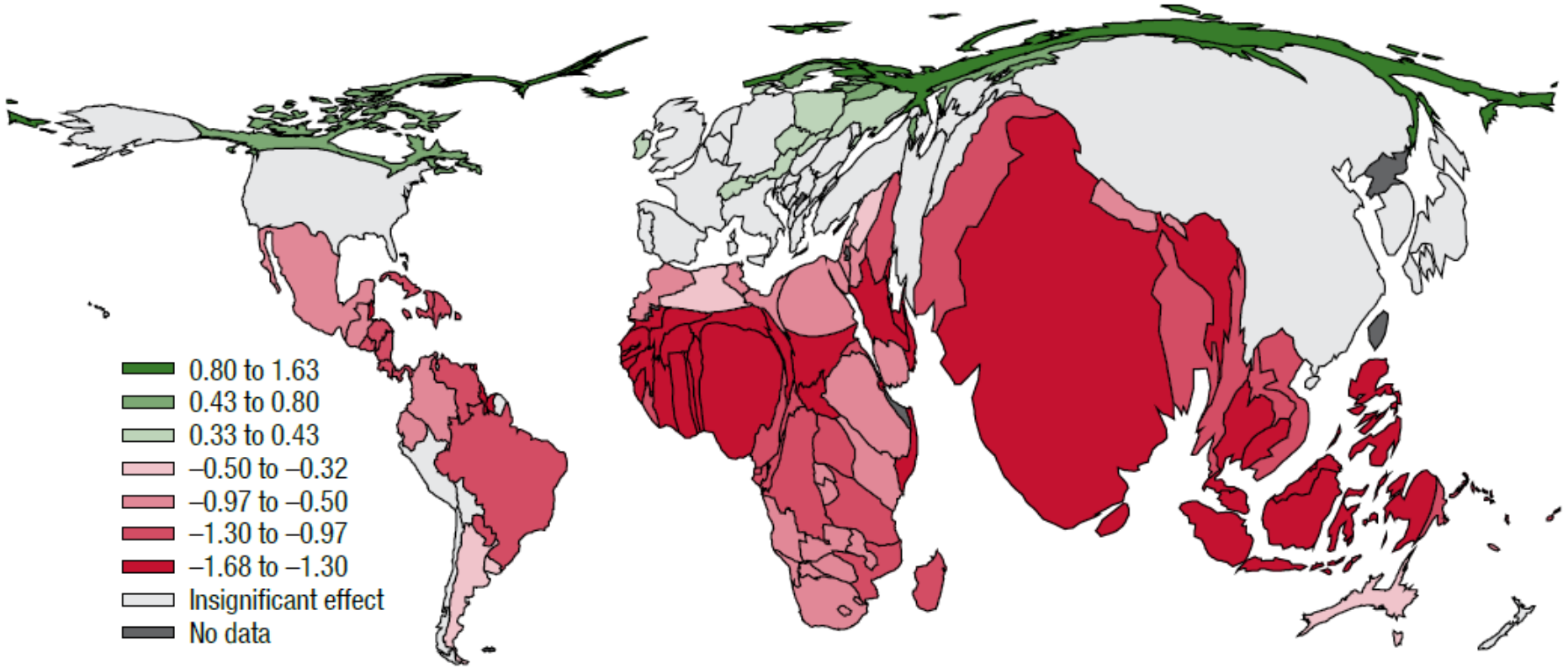
  - ✓Independence / interdependence: (i) systematically reduce global imbalances in trade, finance etc. (ii) mutually advantageous strategy for North and South.

    [Global nature of structural transformation for climate environmental risks, risks for creating enclave economies, ex./ green hydrogen]
  - ✓Leading role of the state
  - ✓South-south cooperation

  re-thinking policy space, industrial policy, gaining insights from past debates, having long-term perspectives & extending the debate in line with current challenges, constraints and opportunities…

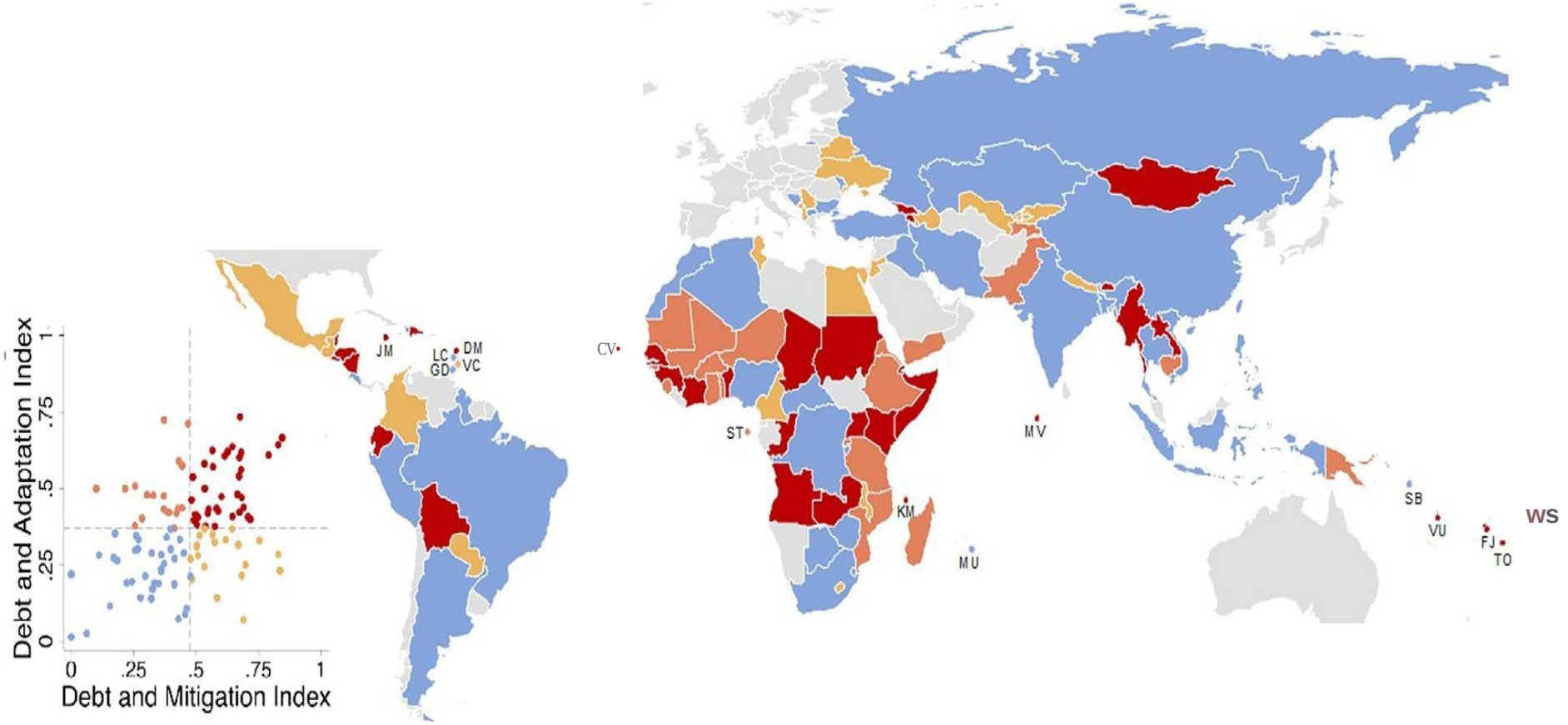
Disproportionate impacts of climate change for developing countries

2. Effect of a 1°C Increase in Temperature on Real per Capita Output at the Country Level, with Countries Rescaled in Proportion to Their Population



Source: IMF (2017), World Economic Outlook, Ch. 3, Fig. 3.8

Disproportionate capacities in adaptation and mitigation
(Debt and Mitigation and Debt in Adaptation Indices)



Source: K. P. Gallagher, R. R. Bhandary, R. Ray and L. Ramos (2023), "Reforming Bretton Woods institutions to achieve climate change and development goals", *One Earth*, 6 (10).

Towards achieving climate change and development goals

✓ *Structural Transformation*

- Greening economies as an engine of growth and structural transformation? Discourse moving away from "burden and challenge" to "take advantage of global green shift"?
- **Transformation towards clean energy sources (energy efficiency, renewable energy)**

(1) energy sector as the primary cause of GHG emissions (IEA: emerging markets and developing economies will account for almost 80% of the global growth in electricity demand in future scenarios)

(2) cost advantages of clean energy: strong economic maturity, investment momentum high

(3) mature, available technologies (IEA definition)

(4) potential for developing economies (ex. meeting diverse national energy and climate targets for Sub-Saharan Africa, 85% of new power generation plants to 2030 should be based on renewables)

(5) energy-security [particularly for fuel-importing countries, extreme price volatility in energy markets]

(6) SME oriented – "manufactured" technologies, basis for developing a manufacturing capacity

(7) clean employment opportunities?

(8) Co-benefits: linkages to other sectors of the economy

(9) Ample global manufacturing capacity offers considerable upside for solar PV, albeit concentrated: China, India, Malaysia, Thailand, Korea, Cambodia and Turkiye

- **Potential for rapid, affordable and clean transition in energy systems is high**

Domestic Resource Capacities for Clean Energy Investments (Pollin, 2020)

- Country Input-Output Tables (2015, OECD)
- Current Level of Domestic Content for all activities that will be important to take clean energy investments in 5 major areas…

Ex. **Solar industry investments in Brazil:**

  - Computer and electronic products—35 % weight
  - Construction—30 % weight
  - Business sector services—18 % weight
  - General machinery and equipment products—12 % weight
  - Basic metals manufacturing—5 % weight

Table A15.6 Change in overall domestic content of clean energy investment activities after 20 per cent import increase with tradable activities

	Energy efficiency investments			Renewable investments	
	Building retrofits	**Industrial efficiency**	**Grid upgrades**	**Solar**	**Wind**
Brazil	95 per cent → 95 per cent	93 per cent → 84 per cent	87 per cent → 75 per cent	90 per cent → 81 per cent	92 per cent → 85 per cent
Germany	91 per cent → 91 per cent	88 per cent → 80 per cent	85 per cent → 72 per cent	88 per cent → 79 per cent	87 per cent → 75 per cent
Indonesia	91 per cent → 91 per cent	87 per cent → 79 per cent	82 per cent → 70 per cent	86 per cent → 78 per cent	83 per cent → 73 per cent
South Africa	86 per cent → 69 per cent	84 per cent → 73 per cent	79 per cent → 63 per cent	84 per cent → 70 per cent	83 per cent → 68 per cent
South Korea	89 per cent → 71 per cent	89 per cent → 77 per cent	84 per cent → 67 per cent	86 per cent → 72 per cent	87 per cent → 71 per cent

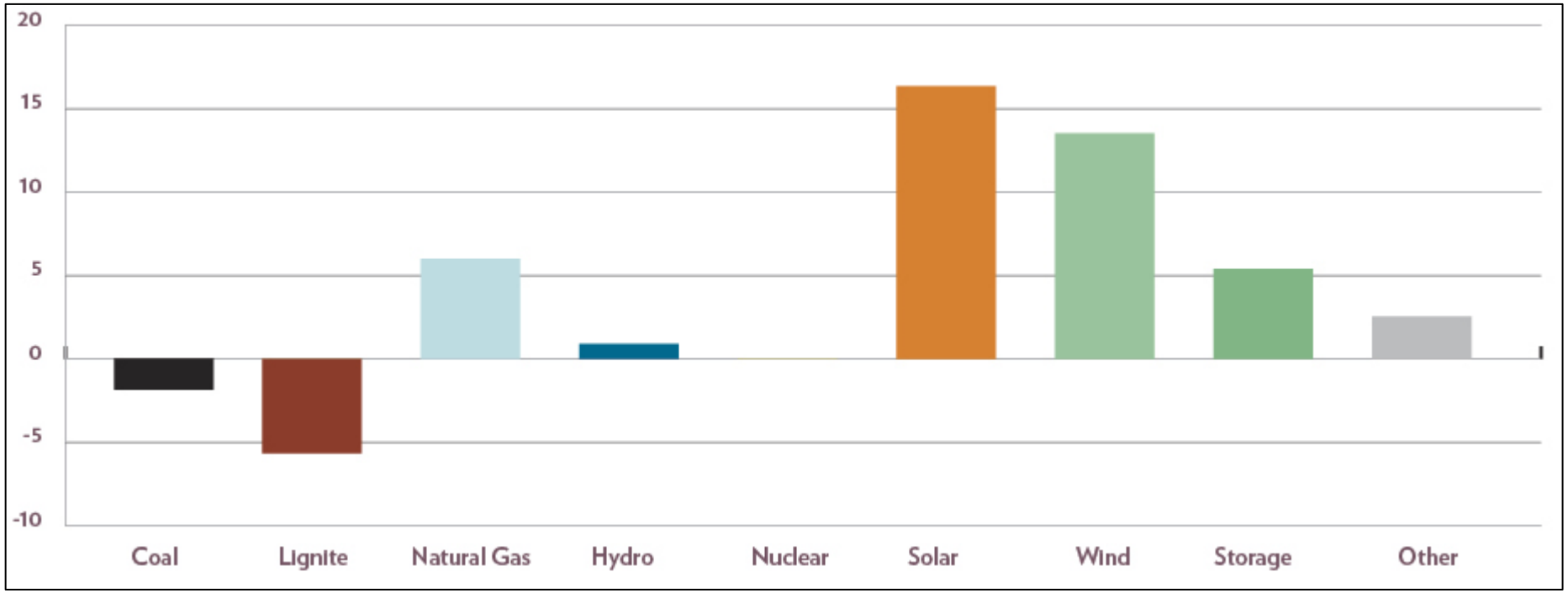
Sources: 2015 OECD input–output country-specific tables. Methodological details in Pollin et al. (2015: chapter 5 and appendix 2).

(Pollin, 2020)

Turkey's Decarbonization Pathway: Net Zero in 2050,
A Cost-Benefit Analysis 2020-30

ELECTRICITY PRODUCTION

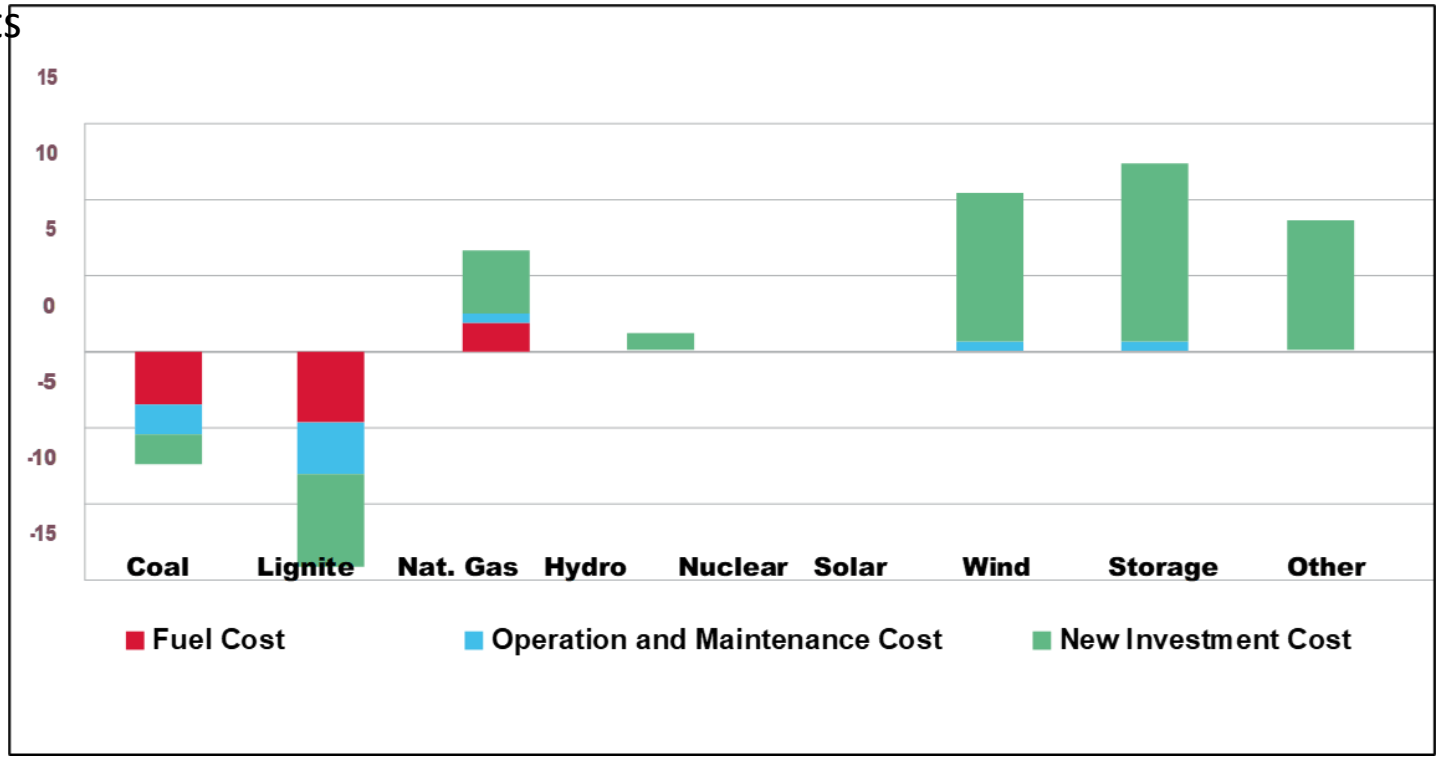
Changes in installed capacity in the electricity sector in Net-Zero Scenario w,r,t Baseline Scenario (GW)



Turkey's Decarbonization Pathway: Net Zero in 2050, **A Cost-Benefit Analysis 2020-30**

ELECTRICITY PRODUCTION

- Additional Costs (Under Net Zero Scen. w.r.t Baseline Scen.)
  - Investment Cost for additional capacity installments
  - Operation and Maintenance Costs
  - Fuel Cost



Turkey's Decarbonization Pathway: Net Zero in 2050, A Cost-Benefit Analysis 2020-30

ELECTRICITY PRODUCTION

	Costs (Billion Dolars)	Co_2 Emissions (Million Ton
ELECTRICITY SECTOR		
Additional Capacity and Storage Investment Cost	**+35,04**	**-587,66**
Operation and Maintenance Cost	**-1,02**	
Fuel Cost	**-6,38**	
Grid Operation Costs (Re-prod. and Renewab. Curtailment)	+0,18	
Grid Investment Cost	+1,32	
TOTAL ELECTRICTY – PRODUCTION AND GRID	**+29,1**	

Towards achieving climate change and development goals

- Key areas that need urgent attention (IEA, WEO, 2023)

(1) Scaling up clean energy and infrastructure investments in developing economies

- enabling financial and fiscal policy space
- government indebtedness
- high cost of capital for many developing economies

(2) Make transitions resilient, inclusive and affordable

- large geographical concentration of critical minerals

(3) Importance of re-distributional policies

- fossil fuel subsidies

(4) **Find ways for cooperation**

Towards achieving climate change and development goals

Financing Green Transition

- Role of Multinational Development Banks
- Establishing coalitions, such as the Intergovernmental Group of 24, to work as a bloc within the IMF and World Bank (Gallagher et. al, 2023)
- Creating a network of development finance institutions – including the Asian Infrastructure Investment Bank, the New Development Bank, the China Development Bank and more – with assets totaling $18.7 trillion (Gallagher et. al, 2023)
- Broadening agenda, Bridgetown Initiative

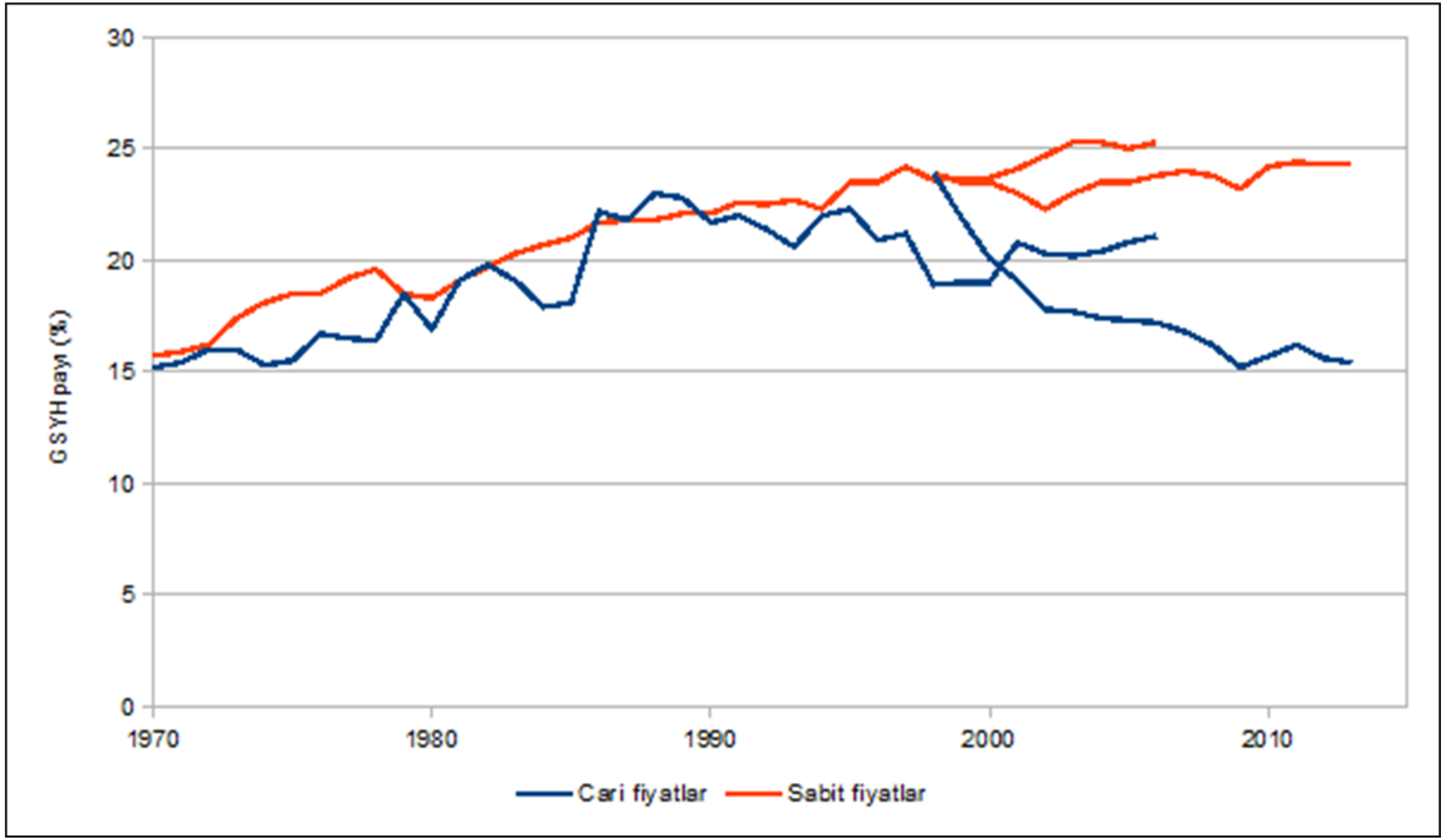
UNCTAD (2023)

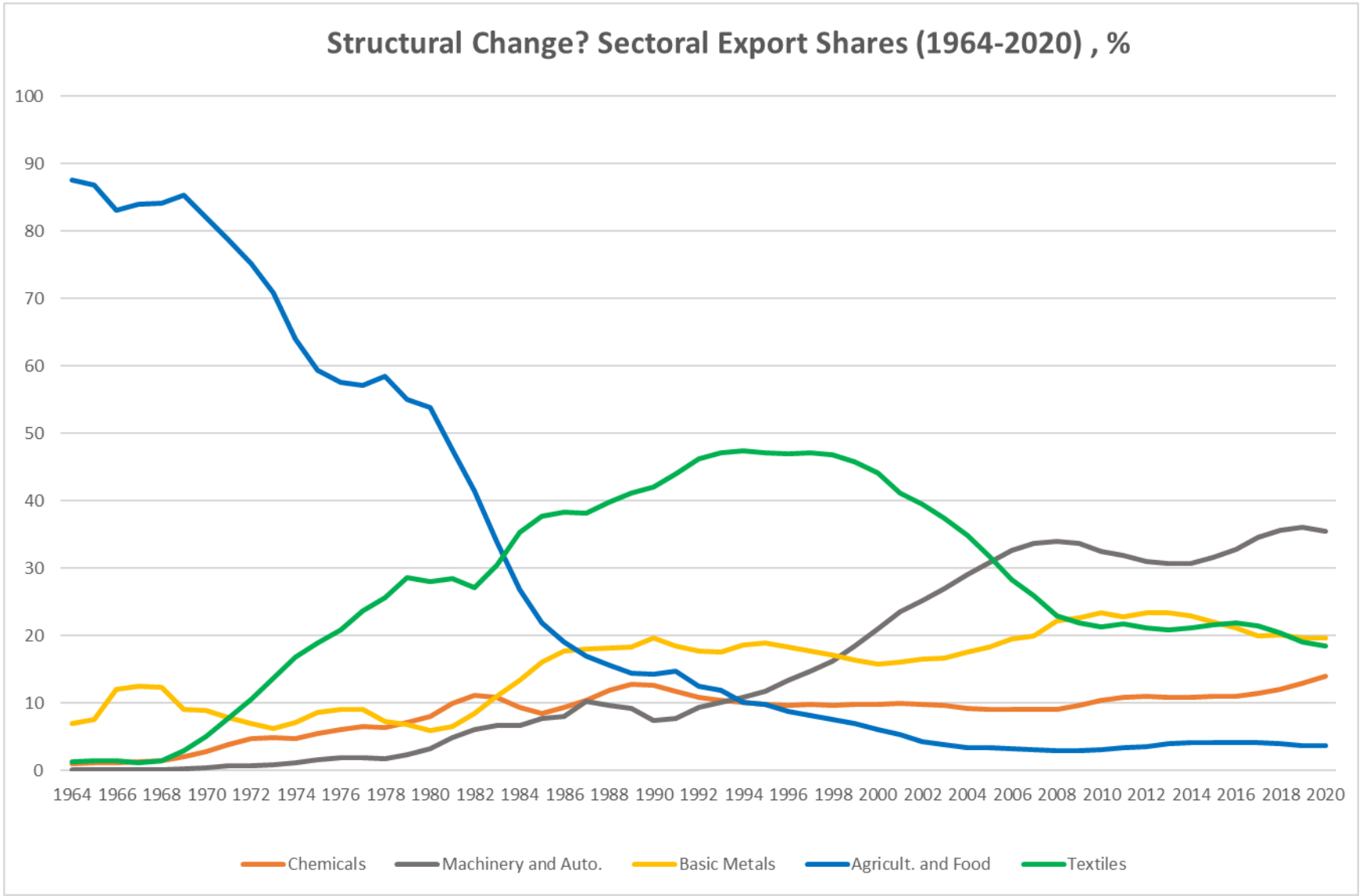
`Aligning national and global challenges is neither straightforward nor automatic, but **requires strategic planning, active policy intervention and effective multilateral cooperation**.`

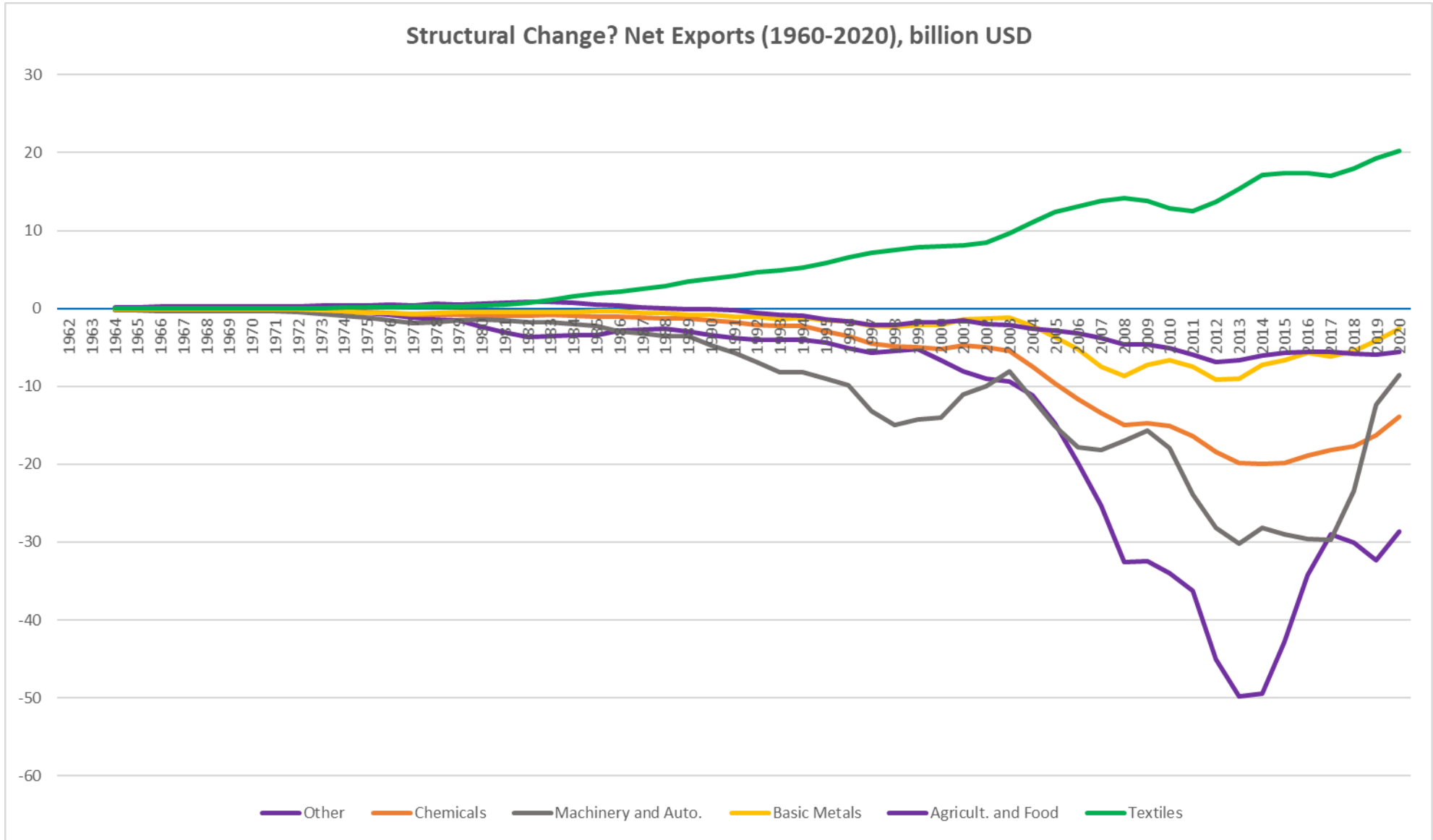
De-industrialization?

Manufacturing VA Share (Current USD, %)						
	1970	**1980**	**1990**	**2000-7**	**2010-12**	**2013-17**
Developed	26.4	22.8	20.6	16.8	14.7	14.0
North Africa	20.8	17.0	20.0	18.0	16.7	16.1
Sub-Saharan Africa	12.7	14.8	15.6	11.6	9.6	10.2
South Africa	23.0	21.8	23.7	18.3	13.5	11.9
Latin America	21.7	20.8	21.6	17.5	14.5	12.9
Argentina	33.3	27.0	24.5	20.0	16.7	14.1
Brazil	27.4	31.0	25.5	16.7	12.6	10.5
Chile	18.6	14.4	19.0	17.2	11.9	11.1
Mexico	18.9	18.6	19.7	18.5	17.5	16.6
East Asia	28.3	34.9	34.2	30.1	29.4	28.0
China	30.4	36.1	31.0	32.8	30.2	29.9
South Korea	17.5	23.1	27.1	27.9	30.9	27.4
South-East Asia	17.7	22.3	24.5	26.6	23.1	21.8
Malaysia	16.4	21.6	21.8	27.7	24.4	22.6
Indonesia	9.2	12.4	20.8	25.3	22.0	20.8
Philippines	27.7	27.6	26.7	24.1	20.8	20.0
Thailand	15.9	21.5	27.4	29.5	28.8	27.5
South Asia	16.2	19.3	20.5	18.9	17.7	15.0

Turkey: Manufacturing Share VA (%), 1970-2015




Structural Change? Sectoral Export Shares (1964-2020) , %
100
90
80
70
60
50
40
30
20
10
0
1964 1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Chemicals
Machinery and Auto.
Basic Metals
Agricult. and Food
Textiles


Structural Change? Net Exports (1960-2020), billion USD
30
20
10
0
-10
-20
-30
-40
-50
-60
1962
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1965
1966
1967
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2020
Other
Chemicals
Machinery and Auto.
Basic Metals
Agricult. and Food
Textiles