

# EU's Public Governance for the Carbon Neutral Economic System and the Green Deal Strategy

Sang Chul Park

Professor at School of Knowledge based Technology and Energy,  
Tech University of Korea,

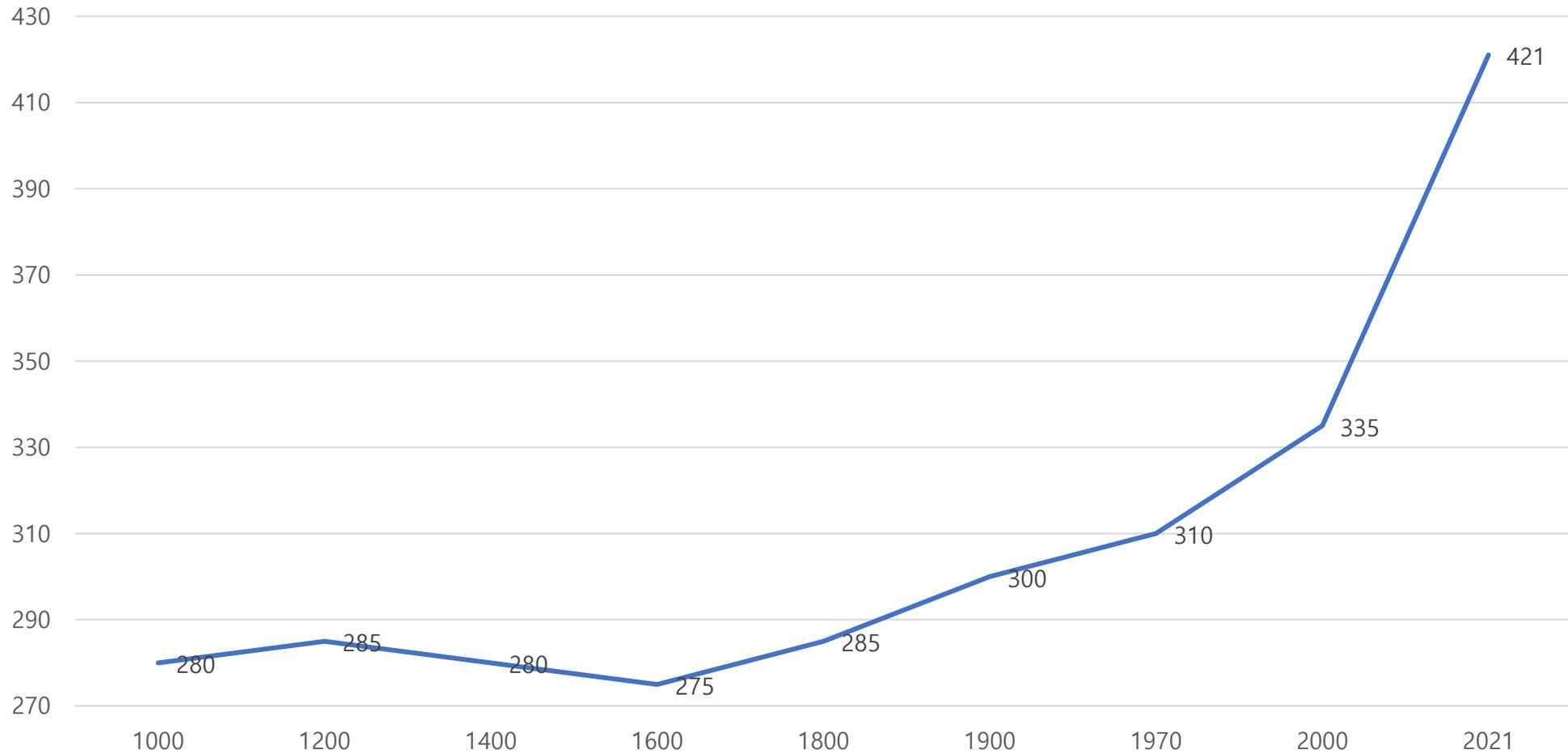
[scpark@tukorea.ac.kr](mailto:scpark@tukorea.ac.kr)

# 1. Introduction

- On going process of the pandemic & Ukraine war
  - Over 15 mil. lives lost, uneven recovery efforts, energy & food crises
- Insufficient achievement of 17 SDGs in the UN
- Delaying transition to climate change
  - 17 global agenda on poverty, hunger, gender equality, affordable clean energy, climate change etc.
  - 13 agenda interacted with climate change issues
- Truly arrived climate crisis: increasing c.a. 1.2 degrees in Celsius
- The Agenda 2030 & the Paris Agreement on Climate Change: increasing global solidarity & leadership for net zero by 2050
  - Negative impacts of climate change on economic, ecological, environmental, political & social areas

- Climate crisis based on short term since the Industrial Revolution increasing carbon emissions (See fig. 1)
- Negative impacts proven by the report of Intergovernmental Panel of Climate Change (IPCC) in 2014
- Urging to control global warming between 1.5 and 2 degrees above pre-industrial level till 2050: latest report of IPCC (2021) demanding till 2040
- Excessive carbon emissions based on fossil energy & increasing total population: great challenge
  - Missing net zero goal by 2050 causing high costs between 4~14% of global GDP
- Goals of research
  - Discussing climate change related to core issues of UN SDGs
  - Focusing EU's energy and climate policy
  - Exploring EU's public governance for carbon neutral economic system & green deal strategy

Figure 1: Global Trend of Atmospheric CO2 Concentration (As of 1000~2021, PPM)



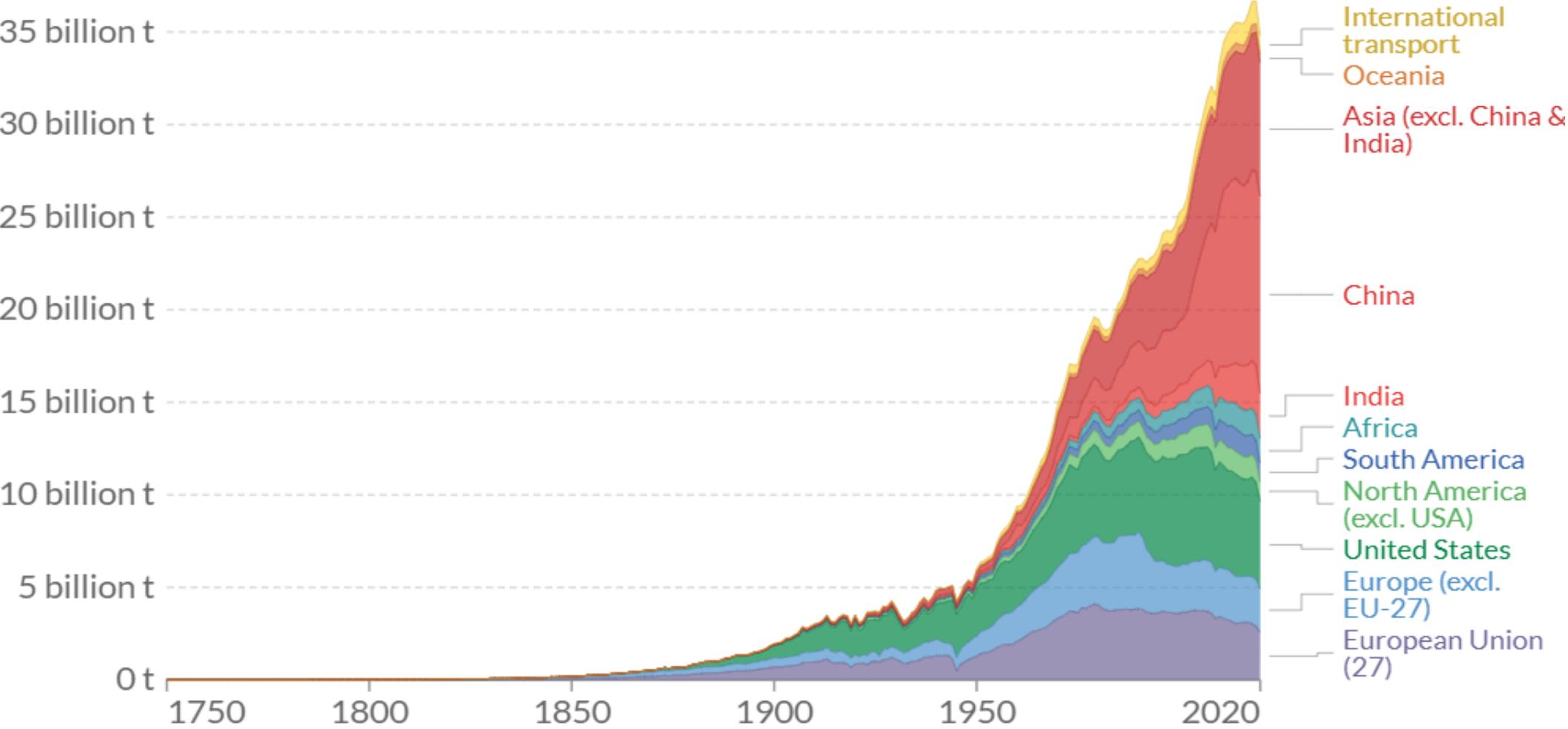
Source: [www.co2levels.org](http://www.co2levels.org), 2022

## 2. Background and Rationale

- EU Climate Policy

- Based on multilateral approach following UN's agreements
- Kyoto Protocol in 1998: reducing 8% of global carbon emission compared to the 1990 level
- Setting target of climate policy in 2007: reducing 20% of carbon emission by 2020
- Forming legal force for reduction target in 2008 by European Commission, European Parliament & European Commission
- Comprehensive EU's climate policy since 2007: market based climate policy regulation & broader policy mix (See fig. 2)
- European Environmental Agency (EEA) investigating & analyzing total carbon emissions & trends since 1993: reducing 22% of carbon emissions in 2017 in line with UN Framework Convention on Climate Change (UNFCCC)

Figure 2: Trend of Annual CO2 Emissions from Fossil Fuels by World Region (As of 1750 ~2020)



Source: [www.ourworldindata.org](http://www.ourworldindata.org), 2022

- **Ambitious emission target of European Council**: 40% reduction by 2030 in 2014 regardless of final outcome of Paris Climate Agreement in 2015
- **More ambitious emission target in 2021**: 55% reduction by 2030 known as Fit For 55 Package
- **EU Energy Policy**
  - **Disadvantageous position in fossil energy resources**: c.a. 50%
  - **Dependent on energy import particularly from Russia**: oil (25%), gas (40%) in 2021
  - **Energy crisis in EU since Ukraine War** & different national interests among member states
  - **One of the most important political issue** along with climate policy since 2007
  - **Three major challenges for energy policy**: sustainability, security of supply, competitiveness
  - **Setting targets of 20/20/20 as action plan** in 2009

- Developing legislative processes since 2007
  - Ratifying article 194 of Treaty on the Functioning of European Union (TFEU): provisions of security of supply, energy networks, coal, nuclear energy etc.
- Strategies for Energy 2020 & Energy Roadmap 2050
  - Focusing on 20/20/20 targets, restructure of energy market, & climate targets
  - Targeting emission reduction of 95% by 2050 after Energy 2020: carbon neutrality, energy security, competitiveness
- Energy Union Strategy in 2014: common energy policy
  - Maintaining each member states' right to choose energy sources and structures of energy supply (See table 1)

Table 1: The EU Energy Policy Targets by 2020 and 2030 (As of percent)

<b>Policy Goals</b>	<b>Targets by 2020</b>	<b>Targets by 2030</b>	<b>Roadmap 2050</b>
Restructuring energy market in the EU	Reduction of 20% greenhouse gas emissions	Reduction of at least 40% greenhouse gas emissions	Reduction of 95% greenhouse gas emissions
Reaching climate target	20% energy consumption with renewable resources	32% energy consumption with renewable resources	
Secure, sustainable, competitive, and affordable energy supply	Increase of 20% energy efficiency	Improvement of 32.5% in energy efficiency	
Carbon neutral		Interconnection of 15% in the EU's electricity system	

Source: Author's own adaptation based on Langsdorf, 2011 and European Parliament, 2021

- EU's Major Energy Resources & Carbon Neutral Economic System
  - Expecting renewable energy (65%) & nuclear energy (20%) in total power generation by 2050
- Most important energy resources for carbon neutral economic system
  - Including nuclear energy and natural gas to taxonomic categories
- Green Deal Strategy (2019)
  - Long term development roadmap until 2050
  - Focusing on private & public sectors' cooperation
  - Targeting to become first continent of carbon neutral area by 2050 & cohesion member states
  - Challenges & opportunities in environment, economy, & society
  - Regarded as typical EU model of governance system: active involvement of all economic actors, persons, & institutions

- Carbon neutral economic system creating circular economic system for sustainable development in EU
  - Solving fundamental climate change problems: flood, draught, Artic ice melting etc.
  - Outperforming annual reduction of carbon emissions: 1990~2005 (0.5%), 2005~2017 (1.5%), 2017~2030 (2%) (See table 2)

Table 2: The Trend of Carbon Emissions in the EU (As of 1990~2030, Mil. Ton)

Sectors	Year				Ratio of 1990 Level		
	1990	2005	2017	2030	2005	2017	2030
Energy Supply	1,869	1,713	1,276	1,053	92	68	56
Manufacturing	841	636	483	459	76	57	55
Process & Production	517	466	379	340	90	73	66
Transportation	787	976	946	887	124	120	113
Other Energy Consumption	854	794	663	555	93	78	66
Agriculture	542	434	432	432	80	80	80
Waste	236	200	136	99	85	58	42
Aviation	69	131	150	165	190	217	238
<b>Total</b>	<b>5,715</b>	<b>5,350</b>	<b>4,465</b>	<b>3,989</b>	<b>94</b>	<b>78</b>	<b>70</b>

Source: EEA, 2019

### 3. Analytical Framework

- Key Concept of Public Governance

- Interdisciplinary field of study focusing on relationships of power between government authorities, civil society, and market

- Conceptualizing a set of broad & interrelated social & political evolutions since 1990s

- Processes making rules based on laws & enforcing these

- Good governance emphasizing participatory, transparency, accountability, & relationships (UNDP, OECD, WB etc.)

- Good public governance regarded as most significant element for SDGs

- Pandemic affecting negatively to public governance

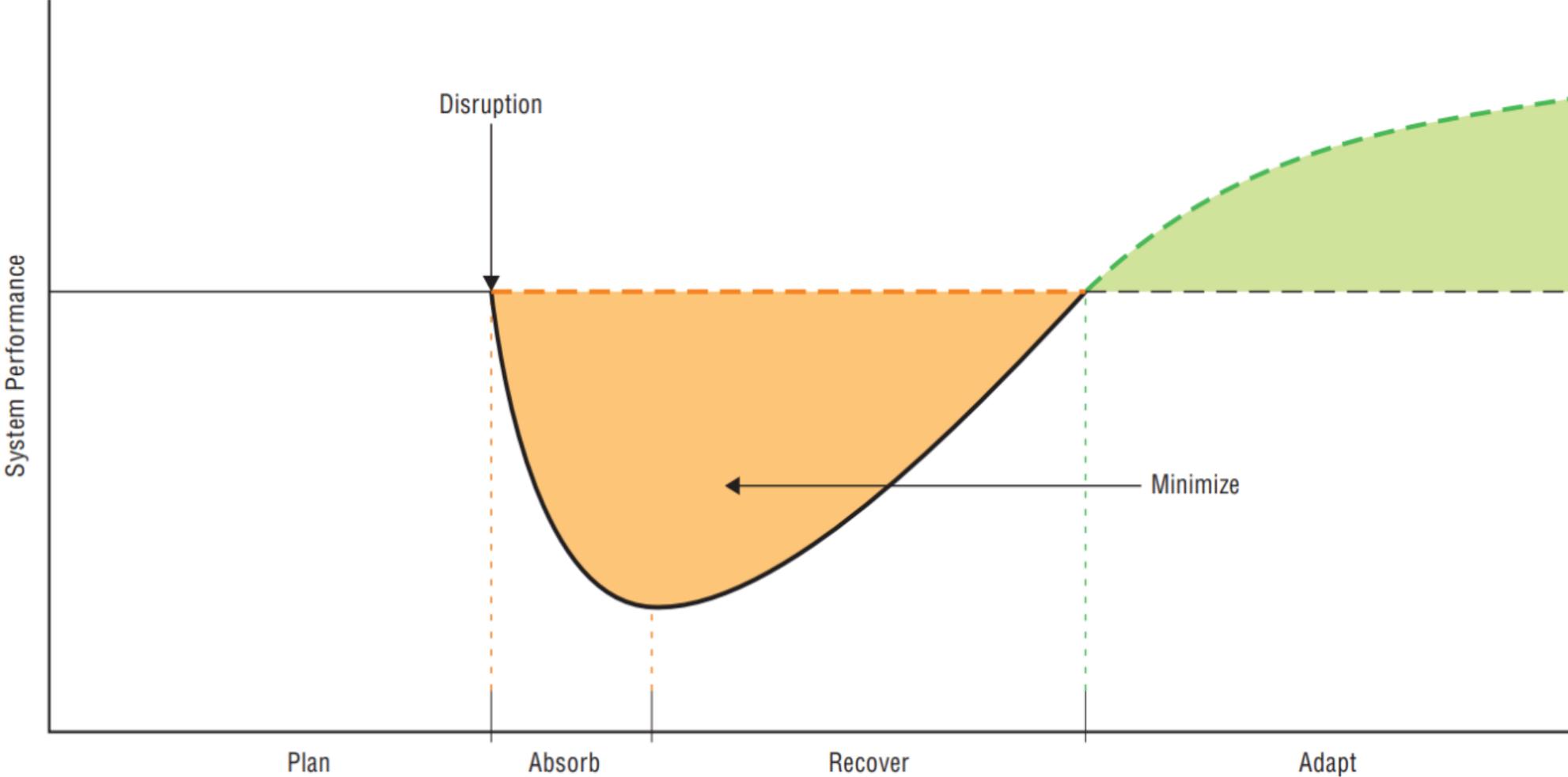
- Strengthening resilience based on good public governance to future risks

- Analytical Framework for Public Governance
  - Facing multidimensional challenges since GFS in 2008: declining people's trust on climate change, growing inequality, corruption etc.
  - Emerging new challenges of public governance in environment, society, & economy: need for new analytical tool & methods based on holistic, integrated & innovative approaches
  - Power shift from powerful interest groups to public interests
  - Focusing on good & sound governance reflecting value based approaches: resources for public interests
- Public governance in democratic model strengthening societies' resilience: targeting climate neutral in post COVID-19 era
  - Values of sound public governance as analytical tool: formulation, implication, communication & evaluation in all policy making processes

- Framework Model & Main Arguments

- **Four stages of resilience model (OECD):** planning, absorption, recovery, & adaptation (See fig. 3)
- **Resilience model applied to government**
- **Acquiring inputs** of employees, funds, assets, infrastructure etc. & producing public goods & services of health, education, security, markets etc.
- **Resilient government delivering similar public goods & services** after disturbance, recovering & adapting disturbances for minimizing impacts of future threats & risks
- **Impossible in reality to foresee & plan for threats & risks** due to complex, interconnected & interdependent global system: COVID-19
- **Ensuring resilience as much as possible in all governments' level** to safeguard their citizens' wellbeing & public trust: climate change

Figure 3: Resilience Model in Four Stages



Source: Adopted by Linkov et al., 2019

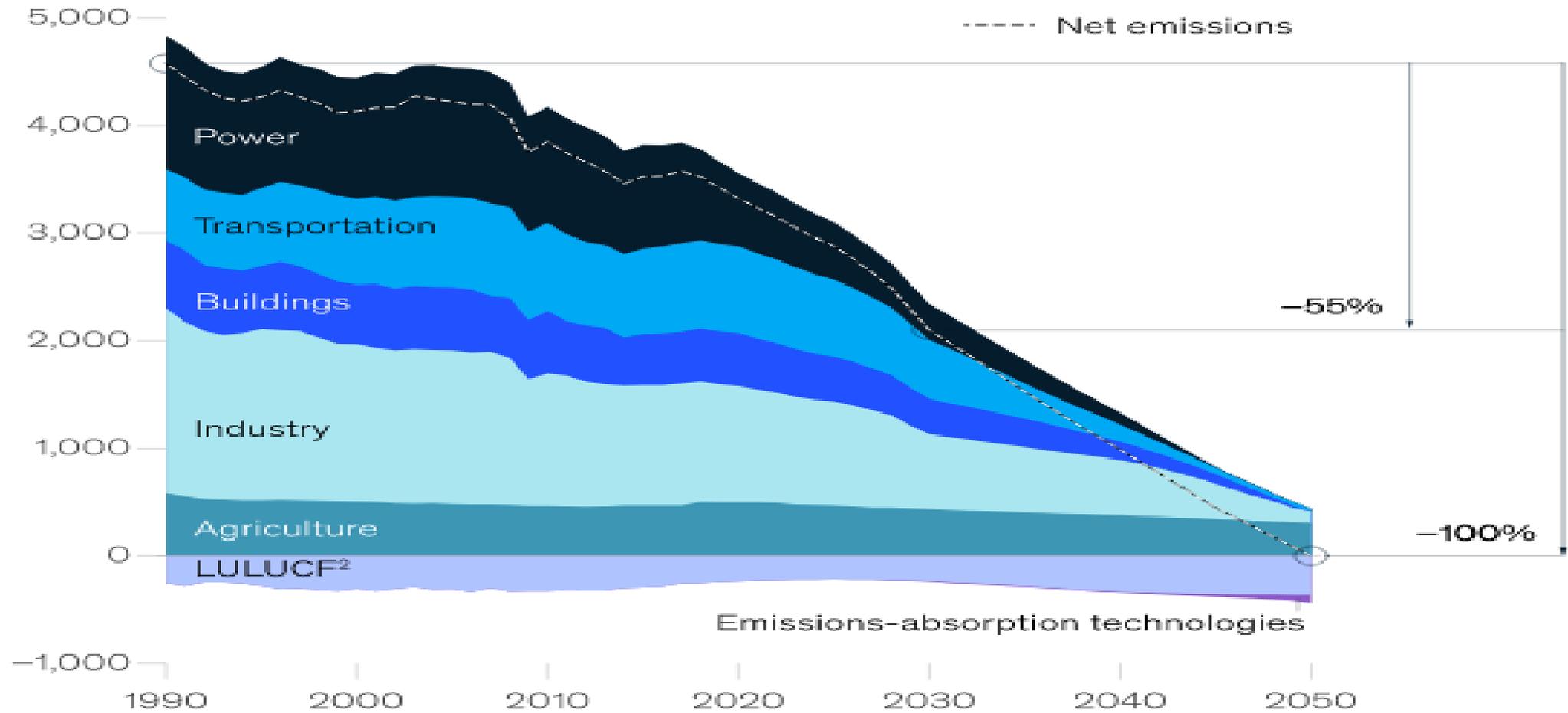
Prof. Dr. Dr. Sang Chul Park

## 4. Issue Analysis

- EU's Carbon Neutral Economic System (CNES)

- **A Clean Planet for All** (2018) as strategic vision for long term carbon emissions reduction
- **Carbon neutrality for economic activity by 2050**
- **Major sources of carbon emissions:** power generation, transportation, buildings, industry, & agriculture
- **CNES for sustainable economic growth:** quality of life for citizens
- **Energy transition policy:** power generation, transportation & housing vs. industry & agriculture by 2050
- **Land use (LU), land use change (LUC), forest entail (FE), carbon capture storage (CCS), technology development (TD)** (See fig. 4)

Figure 4: The Channel of Carbon Neutral Emissions in the EU based on Cost Optimization  
 (As of 1990~2050, Mega Ton)



Source: Mckinsey & Company, 2020

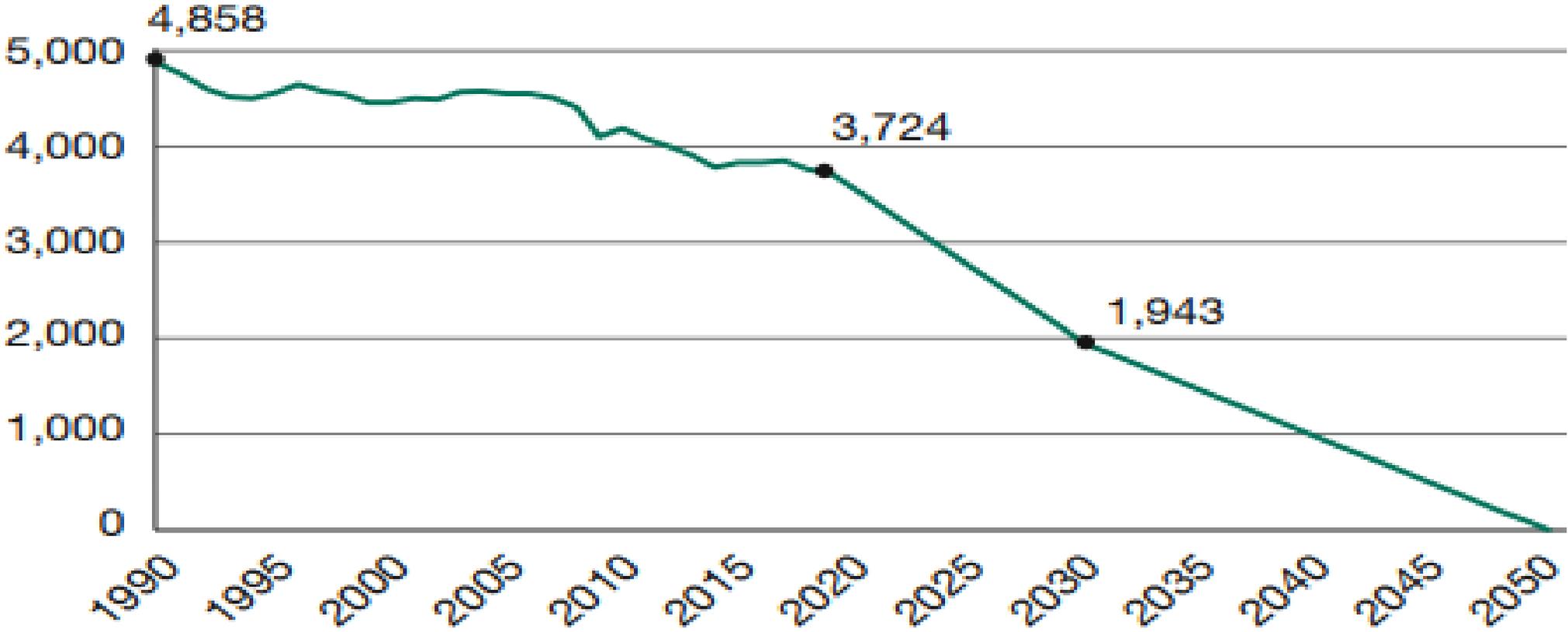
- EU's Green Deal Strategy

- **European Green Deal Strategy (GDS)** (2019) as long term development roadmap: first carbon neutral continent in the world by 2050
- **Aiming to climate neutrality, resource efficiency, & sustainable industrial competitiveness**
- **Focusing on communal participation of all member states** & enhancing cohesion of EU
- **Establishing decoupling structure** between economic growth & resource consumption: competitiveness in all industrial sectors
- **New growth strategy for system transition**: various challenges & opportunities
- **Influencing to other major countries**: USA, Korea, Japan, China for carbon neutrality by 2050 & 2060

- Pursuing transition of economic & social structures for sustainable development: global leading position in climate, environment, consumer protection, workers' right
- High challenges to meet target of carbon emissions reduction by 2030: from 40% to 55% reduction
- Related to UN's 2030 Agenda for SDGs & core policy direction of EU
- Setting three patterns of carbon emissions reduction: gradual (1990~2020), radical (2021~2030), intermediate (2031~2050)
- Radical reduction period regarded as turning point for GDS during pandemic & post pandemic era (See fig. 5)

Figure 5: Long Term Pattern of the EU's Greenhouse Gas Emissions Reduction (As of 1990~2050)

in Mt CO<sub>2</sub>e



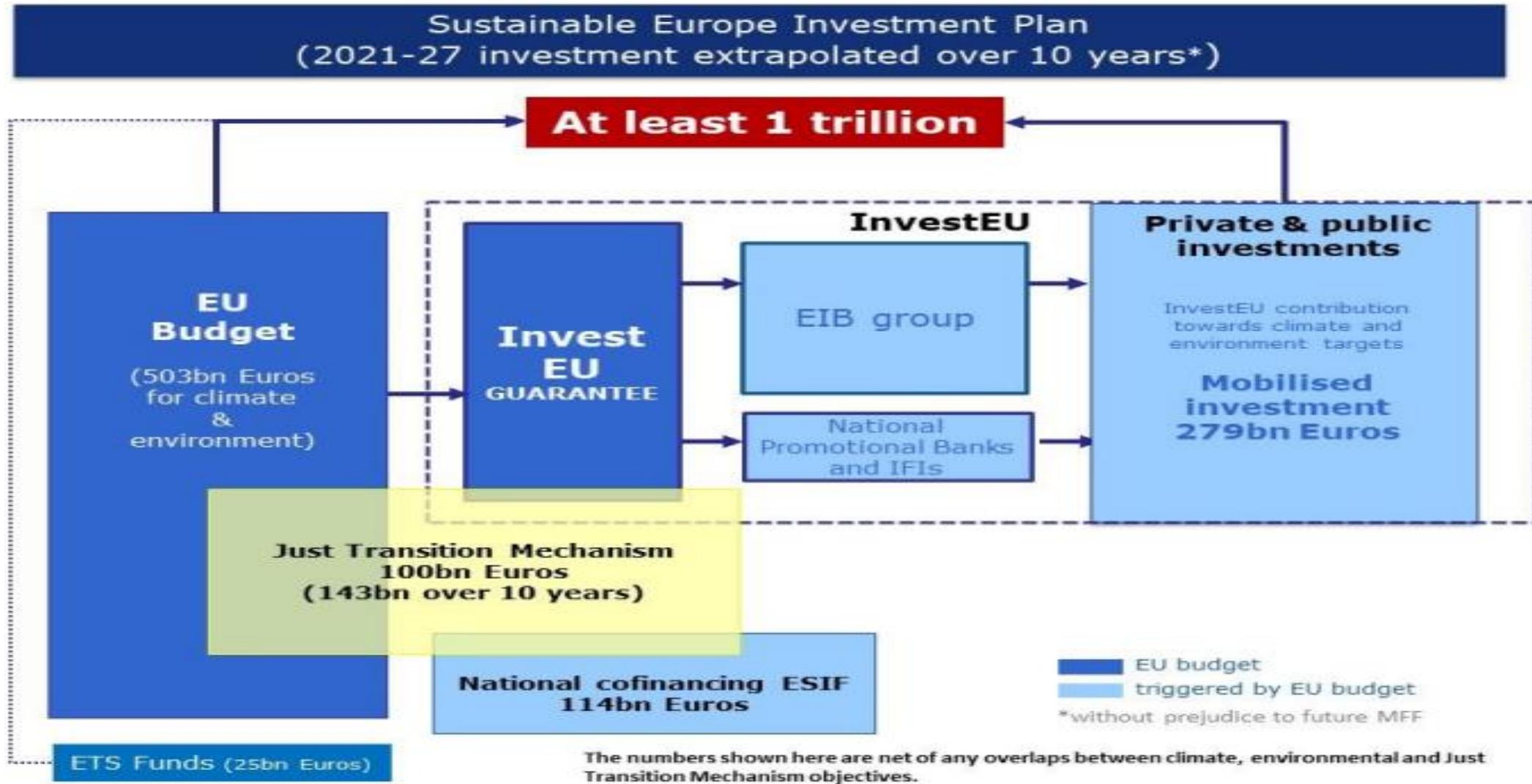
Source: European Commission, 2020a

- Public Governance of CNES & GDS

- Sound public governance for long term target of climate neutrality & building close cooperative system between all actors
- Cooperative system based on seven strategic elements: energy efficiency, renewable energy, integrated mobility, industrial competitiveness, circular economic system, infrastructure & bio-economic system, response to remained carbon emissions
- All policy making processes & implementation based on legal system: rule of law
- Treaty of Functioning the European Union (TFEU) representing legal framework: Article 191~193
- Article 192, Clause 1: new rules & regulations

- Maintaining, protecting, & improving quality level of environment, solving regional & global environmental problems, controlling climate change: EDGS as policy tool (interim targets from 2021 to 2030)
  - Sustainable Europe Investment Fund (SEIP): Euro 260 billion/year, 1.5% of GDP
  - Securing at least Euro 1 trillion in EU budget, public & private investment from 2021 to 2030 (See fig. 6)

Figure 6: Structure of Sustainable European Investment Plan



Source: COM, 2020b

# 5. Empirical Findings

- Backgrounds

- Realizing famines, draught, wars, poverty in their homes (2015)
- High-level political forum adopting 2030 Agenda for Sustainable Development
- 17 SDGs & 169 targets: 13 SDGs related to climate change
- EU's approach to climate neutrality by 2050
- EU Green Deal Strategy as core policy tool for final target by 2050

- Carbon Neutral Economic System

- Implementing modernization & transition of economic structure since the 1990s
- Achieving to reduce 23% of carbon emission compared to 1990 levels in 2018
- Enabling to decouple the relationship between energy consumption and economic growth since 2006
- Strengthening policy framework to reduce 55% of carbon emission by 2030
- Ambitious reduction plan from Mil. 4,858 in 1990 to Mil. 3,724 in 2020 to Mil. 1,943 in 2030
- Half time slot (10 years) & 4 times higher reduction
- Second term as turning point to meet climate neutrality by 2050

- Building cooperative system involved by all economic actors, persons & institutions
  - Private & public cooperation as EU model for good & sound governance
  - Reducing energy dependency from 55% in 2019 to 20% by 2050: saving 70% of energy import cost
  - Energy imports substitution effect accounting for Euro 2~3 trillion from 2031 to 2050
  - Expecting new jobs in renewable energy sectors from 1.5 mil. 2020 to 2.8 mil. by 2050: 2.3 mil. as fulltime job & 0.5 mil. as irregular jobs
- European Green Deal Strategy (EGDS)
  - Protecting environment & shifting to green economy: recovery allocation efforts
  - Package of Euro 807 billion for economic recovery in 2020 & EU budget for Euro 1.85 trillion from 2021 to 2027

- 1,000 project among 2,000 project ready to run
  - Creating significant social, environmental, and economic values
  - Requiring Euro 200 billion of private & public investments & generating 3 mil. jobs
  - High job intensity ratio than traditional & fossil based industries
- Stimulating green & resilient recovery in post pandemic era
  - Green projects accounting from over Euro 1 trillion reducing carbon emissions & creating 12 mil. jobs: same amount of lost jobs under pandemic era
  - Over 20% of projects identified as small sized up to Euro 5 mil.
  - 30% of projects for start ups & SMEs
  - Strong representation of large economies (Germany, France, Italy, Spain)
  - Well balanced in income per capita

## 6. Summary and Policy Implications

- Eyewitness of climate change since 2000 & recognizing by IPCC report in 2014
- UN Agenda 2030 for SDGs
- EU's climate & energy policies since 2007 for carbon neutrality by 2050
- From 20/20/20 by 2020 to Fit For 55 by 2030 & carbon neutral economic system by 2050
- EGDS as policy tool, over Euro 1.85 trillion investment to 1,000 projects, creating 12 mil. jobs by 2050: green & resilient recovery in post pandemic era
- Policy implications
  - Long term project from 1990/2000 to 2050
  - Strategic approaches
  - Green & resilient recovery
  - Mid- and long term control