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# Digital Green Shift of Offshore Wind Energy

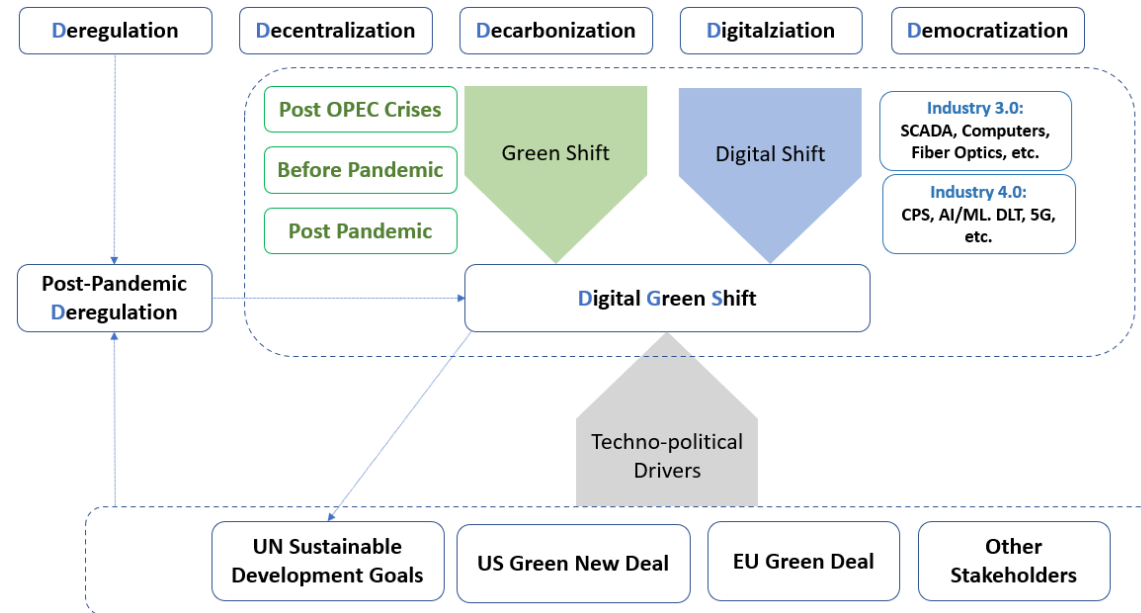
Umit Cali<sup>a</sup>, Salvatore D'Arco<sup>b</sup>, Santiago Sanchez-Acevedo<sup>b</sup>, O. Anaya-Lara<sup>a,b,c</sup>, J.O. Tande<sup>b</sup>

NTNU (a)  
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# Agenda

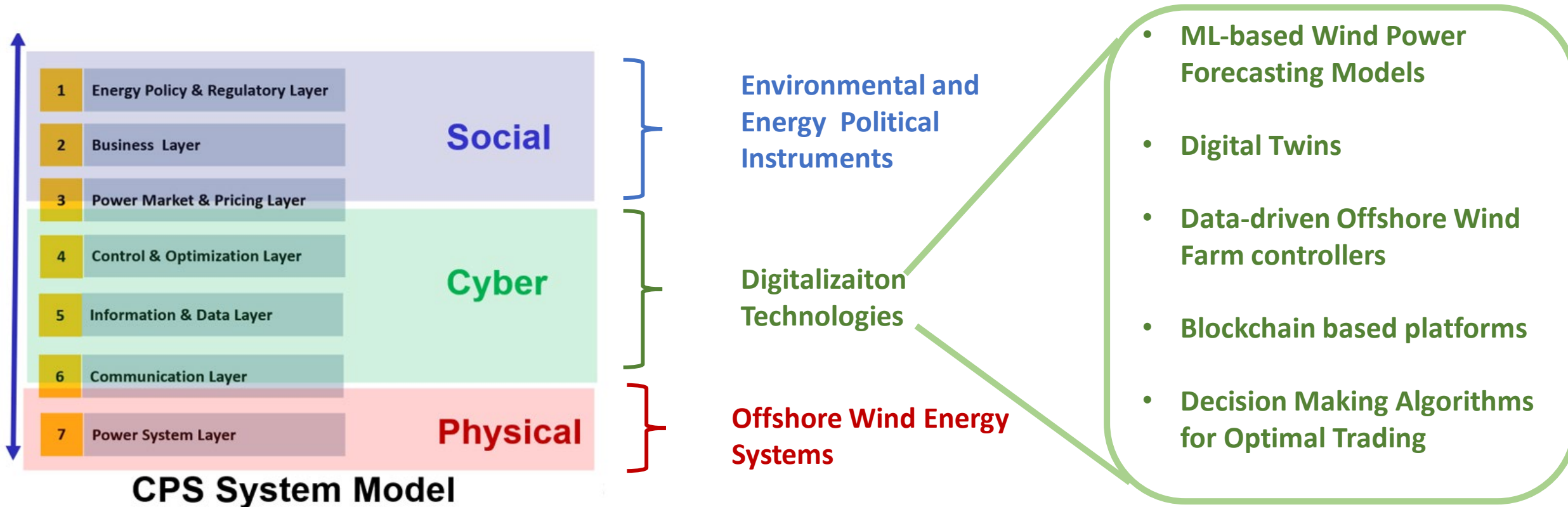
- Introduction
- Digital Green Shift and the 5Ds of Energy
- Energy Cyber Physical Social Systems
- Digital Green Shift and Offshore Wind Energy
- Conclusion and Outlook

# Digital Green Shift & 5 Ds of Energy

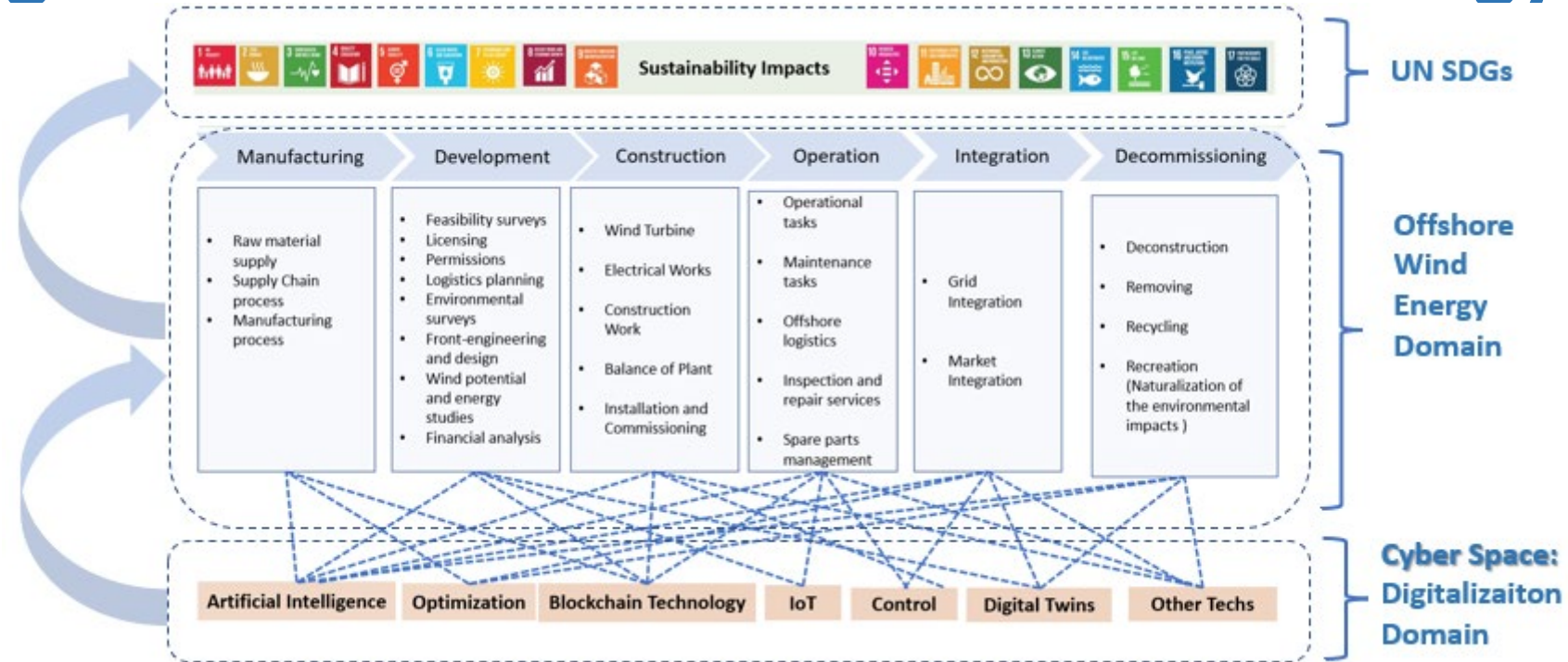


- This massive paradigm change that aims to enable the transformation from fossil fuel-based energy technologies to greener ones, is known as “**Green Shift**”.
- The advent of **Industry 4.0** technologies such as Artificial Intelligence (AI), Distributed Ledger Technology (DLT), **cyber-physical-social systems (CPSS)** and others has triggered a new transformation wave named “**Digital Green Shift**”.
- **Energy policy makers** are meanwhile, ensuring that countries and investors in the energy field develop the necessary energy policy instruments and support mechanisms to facilitate achieving the demanding government targets on emissions and climate change mitigation.

# Energy Cyber Physical Social Systems



# Digital Green Shift & Offshore Wind Energy



- Offshore wind energy domain consists of **large spectrum of phases and domains** from Manufacturing to grid integration.
- Operational and planning tasks are often quite interconnected and sophisticated which also accommodates great potential for the next generation innovative technologies to increase the **economic, technical, societal and environmental added value** of offshore wind energy.
- **Digitalization technologies** are among the most promising ones.

# Conclusion & Outlook

- **COVID 19** levels accelerates the transition to **Full Digital Economies**
- The electric industry landscape is changing due to decreasing cost and increasing penetration of renewable (decarbonization) , distributed energy resources and digitalization technologies (**Green –Digital Shift**)
- **There are upcoming opportunities:** for the massive Offshore Energy Development plans
- **Blockchain** and **distributed ledger technology (DLT)** has a high potential to transform the future energy systems and markets landscape.
- **Fusion of AI and DLT**
- **Digitalization technologies** contribute the **UN Sustainability Development Goals**



**Vielen Dank fuer Ihre Aufmerksamkeit!**

**Takk for oppmerksomheten!**

**Thanks for your attention !**

**Grazie per l'attenzione !**

**Gracias por tu atención !**

**Ilginize teşekkürler!**