Technology & Development Shaping a Green, Connected and Sustainable World

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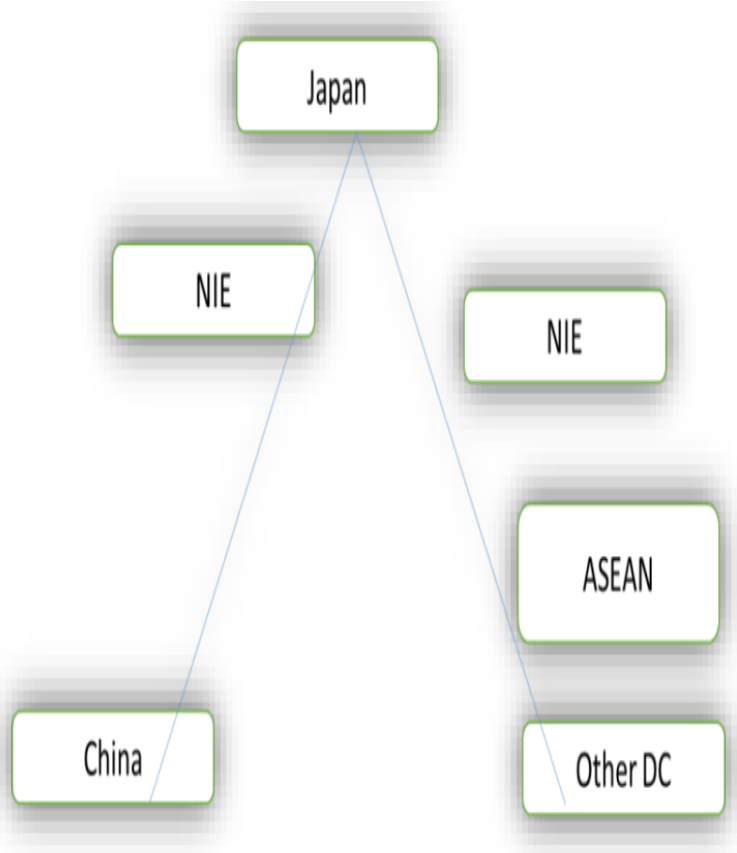
Economic Research Institute for ASEAN and East Asia

Flying Geese Patterns of Technology and Development of Production Networks

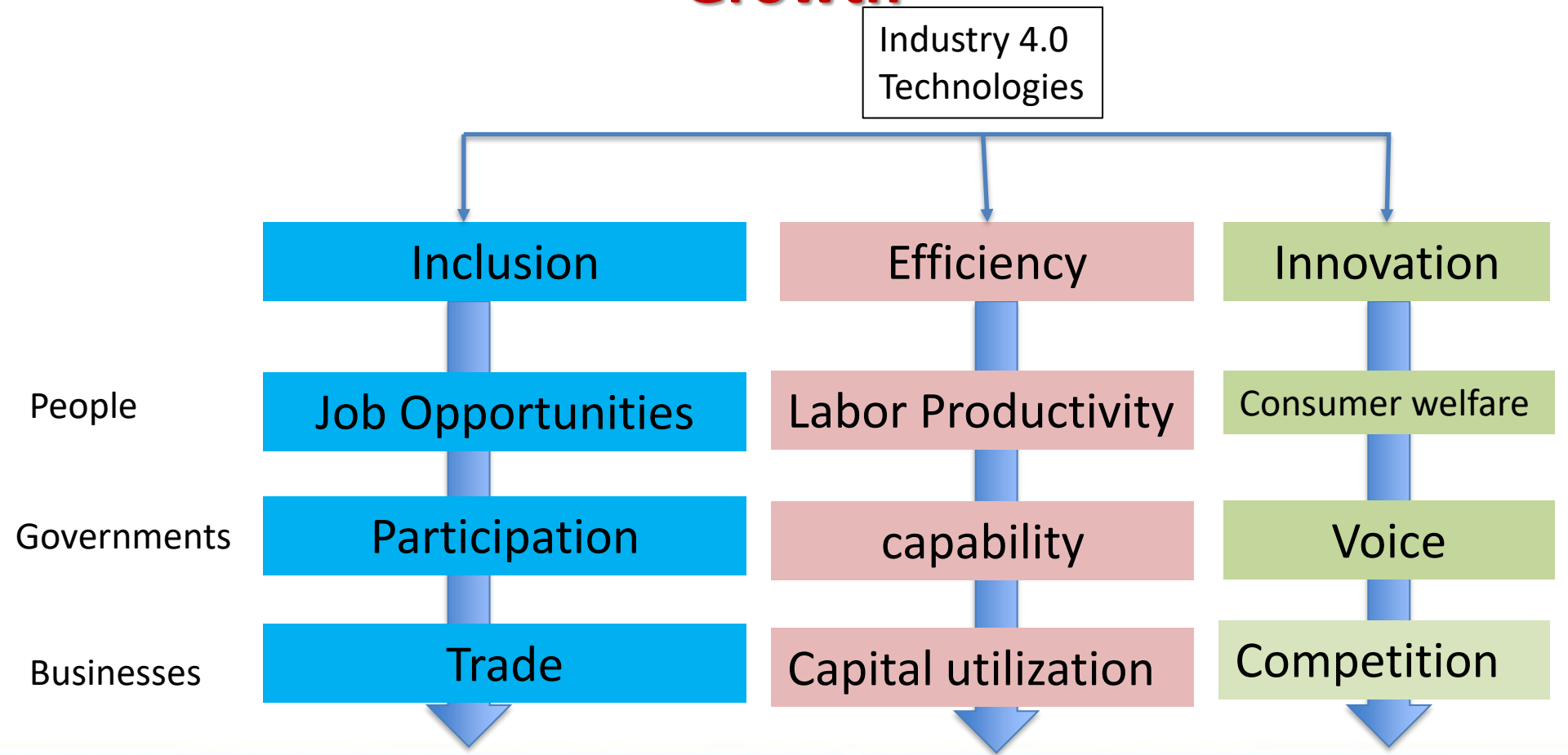


Multinational corporation	Product/industry	Extent of network
Universal Consumer Products	Detergent	Indonesia, Singapore
PT Indo Sukses Makmur	Detergent	Indonesia, Singapore
Sanden	Automotive	Singapore, Thailand
Denso	Automotive	Indonesia, Malaysia, Philippines, Thailand
Toyota	Automotive	Indonesia, Malaysia, Philippines, Thailand
Honda	Automotive	Indonesia, Malaysia, Philippines, Thailand
Volvo	Automotive	Malaysia, Thailand
Ford	Automotive	Philippines, Thailand
Sony	Electronics	Singapore, Thailand, Viet Nam
Matsushita	Electronics	Indonesia, Malaysia, Philippines, Thailand
Nestlé/Goya	Food processing	Indonesia, Malaysia, Philippines, Thailand
Samsung	Electronics	Malaysia, Viet Nam
Clipsal/Bowden	Electrical	Indonesia, Malaysia
Yanmar	Agriculture machinery	Indonesia, Thailand

Global Sustainability and Resilience Challenges

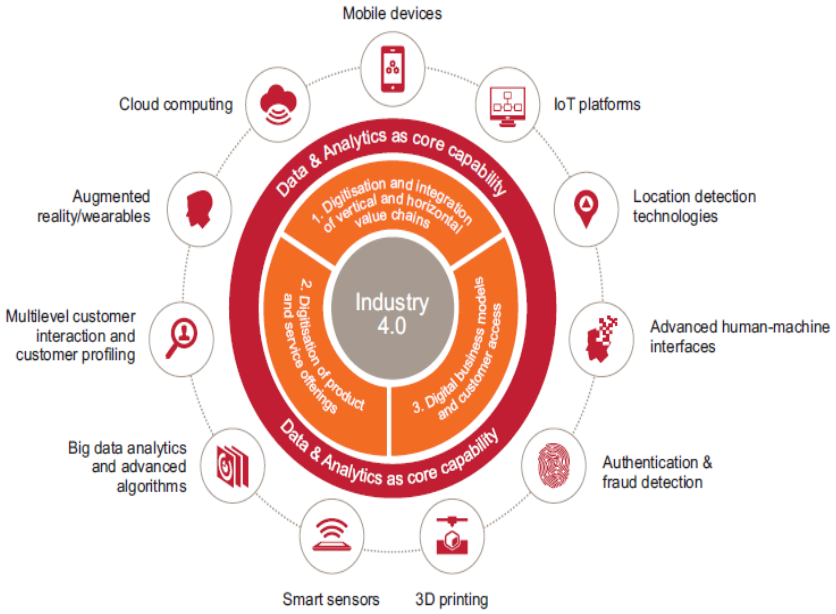
- **Biodiversity**: The region – the second richest is rapidly losing its biodiversity at mass extinction rates, such that 40% of its genetic biodiversity has become extinct. Plastic wastes swimming in the Ocean will outnumber marine biodiversity in 2050
- **Deforestation:** The current deforestation rate- 8,000 km^2 /year in tropical forests leads to a 7% drop in regional rainfall. As the region rapidly urbanizes, more people than ever before demand land, wood, minerals, and other resources.
- **Water Cycle**. The regional water bodies are facing severe impacts through over-abstraction of groundwater and uncontrolled pollution of surface water it may face a 30% shortfall in the freshwater needed to support the economy by 2050
- **Solid and Industrial waste**. As economies grow, individuals become rich, and they consume and discard more. ASEAN's 600 million people account for 4% of the world population but produce 9% of rubbish which is expected to double in 2050.
- **Climate Change and Disasters.** The impacts of natural disasters are more pronounced in ASEAN than in other parts of the world. By 2050, climate change is estimated to reduce the annual GDP of ASEAN by up 6 six percent.
- **Energy Transition**. Accounts for 51% of total GHG emissions. Demand for natural resources such as coal, oil, and natural gases is expected to quadruple by 2050. Current renewable energy share is 14%.

Pathways through which New digital and Green Technologies Promotes Inclusive and Sustainable Growth

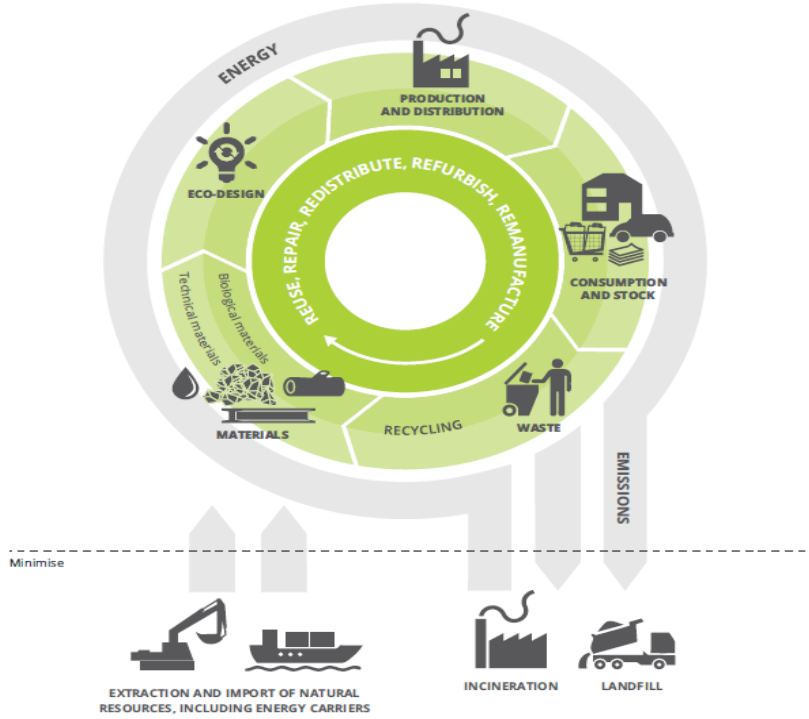


Industry 4.0 and Circular Economy

ASEAN 4IR Framework



ASEAN circular economy Framework



Market-driven economic efficiency

Sustainability and Incisiveness

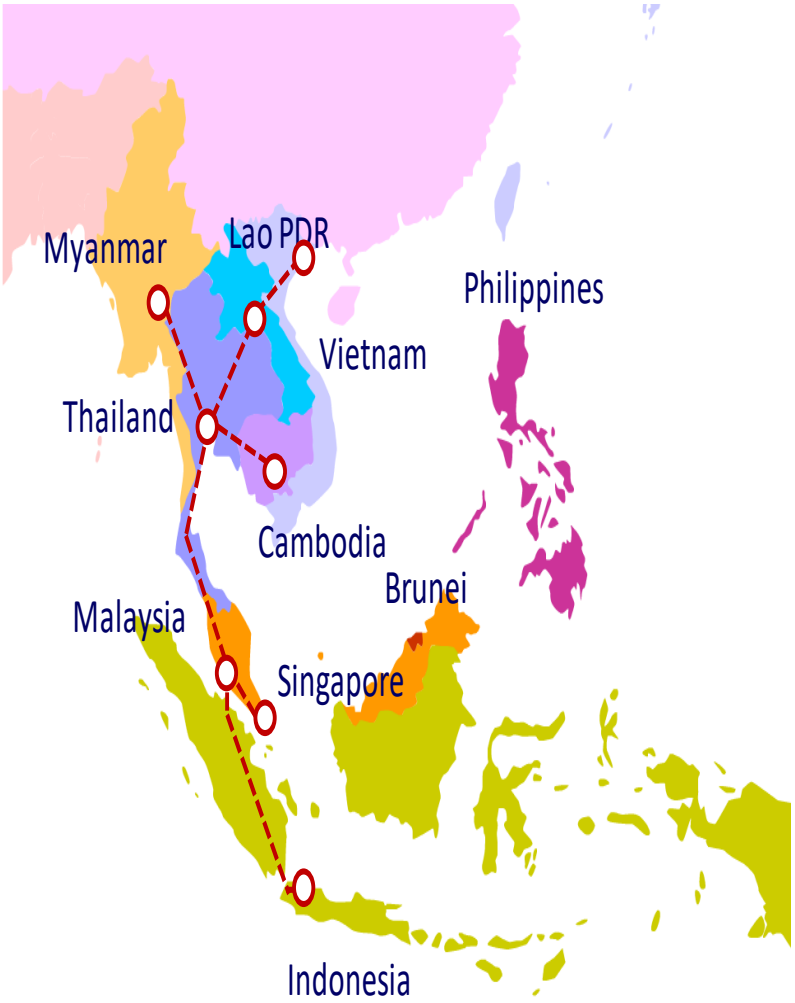
Readiness of Countries to Embrace 4IR and Circular Economy

Country	Higher Education and Training	Goods Market Efficiency	Labour Market Efficiency	Financial Market Development	Technological Readiness	Market Size	Overall Rating
Cambodia	2.8	4.2	4.5	3.9	3.0	3.0	3.6
Indonesia	4.5	4.4	3.7	4.2	3.5	5.7	4.3
Lao PDR	3.2	4.3	4.5	3.8	2.8	2.9	3.6
Malaysia	5.0	5.4	4.9	5.2	4.6	5.0	5.0
Myanmar	2.5	3.6	4.2	2.4	2.2	4.2	3.2
Philippines	4.5	4.2	4.1	4.2	3.9	4.9	4.3
Singapore	6.2	5.7	5.7	5.6	6.2	4.8	5.7
Thailand	4.6	4.7	4.2	4.4	4.2	5.2	4.6
Viet Nam	3.8	4.2	4.4	3.7	3.3	4.8	4.0

Agriculture Digitalization Index of countries in ASEAN and East Asia

Country	Agriculture Digitalisation Index	Availability				Affordability					Enabling Environment				
		2G coverage (%)	3G coverage (%)	4G coverage (%)	Digital Agriculture Availability Subindex	Mobile tariffs	Handset price	Mobile-specific tax	Inequality	Digital Affordability Subindex	Market Access Index	Access to electricity	Basic skills	Online Services Index	Nondigital Enabling Environment Subindex
Australia	86.6	51.4	96.9	88.8	**84.6**	82.5	100.0	87.5	69.3	**86.1**	65.0	100.0	97.2	94.7	**89.2**
Brunei Darussalam	81.2	96.6	95.3	90.7	**93.7**	59.7	71.0	97.5	54.6	**69.6**	94.0	100.0	63.2	63.5	**80.2**
Cambodia	71.6	99.7	97.8	77.6	**90.1**	48.6	36.8	76.2	76.8	**56.2**	96.3	91.6	40.9	45.3	**68.5**
China	59.6	62.9	12.1	14.5	**23.2**	78.7	63.7	86.9	44.0	**68.9**	91.5	100.0	64.7	90.6	**86.7**
India	62.3	87.2	35.1	17.6	**38.5**	71.8	61.8	66.3	65.5	**66.4**	99.6	95.2	48.0	85.3	**82.0**
Indonesia	56.4	62.6	48.5	11.7	**36.6**	64.0	37.9	85.9	62.3	**60.2**	64.1	98.5	59.3	68.2	**72.5**
Japan	83.6	3.4	93.0	90.6	**74.1**	72.9	87.1	87.5	96.8	**84.8**	99.0	100.0	77.6	90.6	**91.8**
Korea Rep.	83.1	11.6	98.9	99.9	**81.8**	71.0	68.1	81.4	62.0	**70.4**	99.9	100.0	88.8	100.0	**97.2**
Lao PDR	50.2	84.8	70.0	14.7	**50.8**	40.0	40.2	46.9	61.8	**45.8**	55.8	97.9	42.7	19.4	**54.0**
Malaysia	75.9	87.7	83.9	78.7	**82.6**	69.3	45.1	93.2	38.8	**60.7**	85.5	100.0	66.7	85.3	**84.4**
Myanmar	44.1	39.1	19.8	0.8	**16.1**	61.7	37.8	89.6	62.8	**60.3**	92.0	66.3	39.7	25.9	**56.0**
New Zealand	88.7	82.5	91.3	93.1	**90.3**	78.4	93.8	81.3	71.5	**82.2**	90.4	100.0	90.7	92.9	**93.5**
Philippines	59.9	88.0	57.0	14.1	**46.0**	43.8	46.1	85.0	42.3	**52.4**	94.9	94.9	62.2	72.9	**81.2**
Thailand	84.2	99.8	99.7	99.6	**99.7**	74.6	53.4	91.3	53.0	**67.3**	99.0	100.0	64.5	79.4	**85.7**
Vietnam	69.7	93.7	85.3	45.4	**71.0**	56.2	33.1	91.3	67.3	**58.5**	95.7	100.0	57.3	65.3	**79.6**

Augmenting Energy Transition through Cross Border Energy

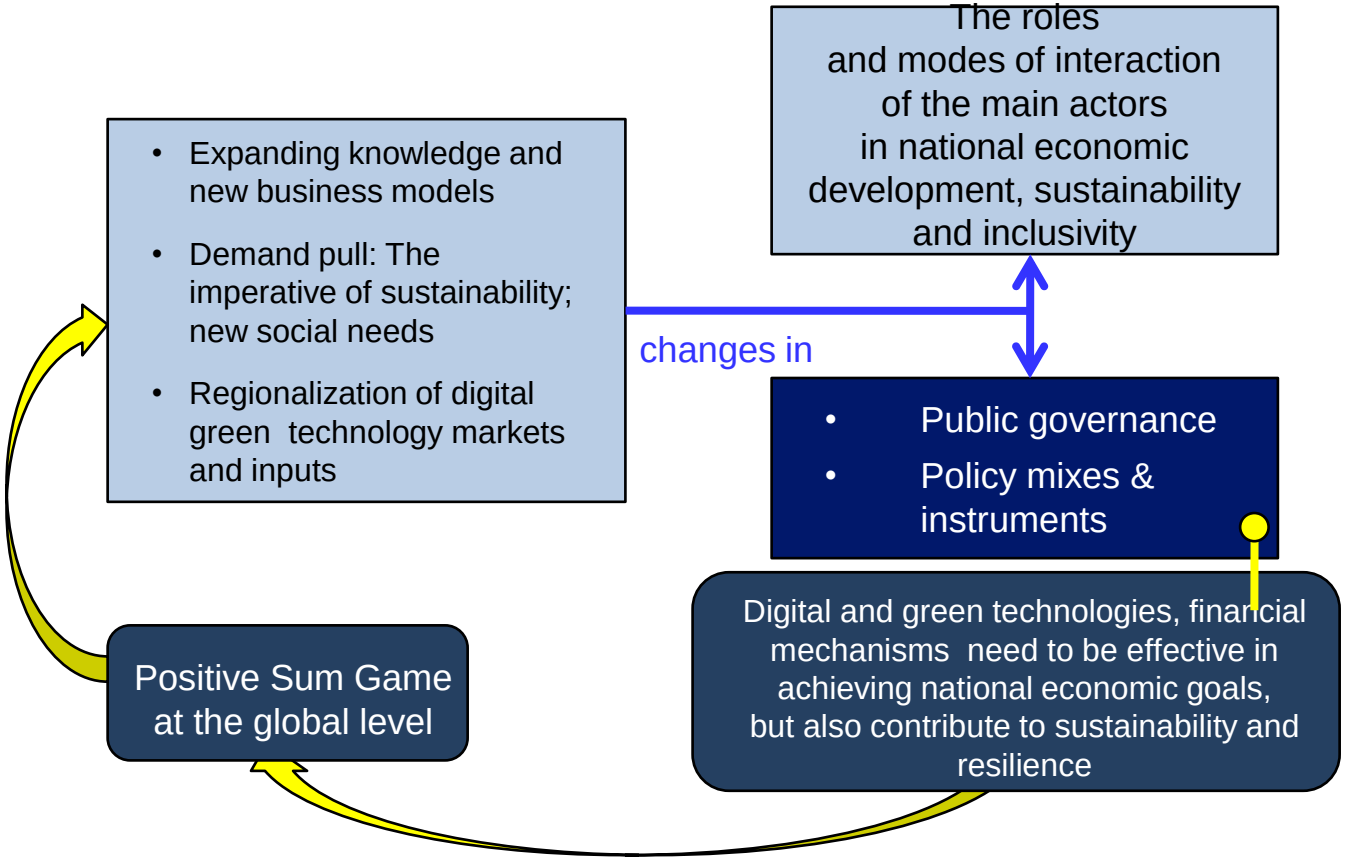


Integrating Renewables into power transmission in the ASEAN would save over $ 25 billion over 20 years by substituting hydro-power for power generation using fossil fuels

Route	Interconnection line construction cost		Net benefit (gross benefit - line cost)		Benefit/Cost ratio
	Mil. USD	US¢/kWh	Mil. USD	US¢/kWh	
THA-LAO	1,400	0.25	19,881	3.51	14.2
VNM-LAO-THA	1,950	0.29	22,610	3.36	11.6
LAO-THA-MYS-SGP	1,860	0.26	25,490	3.60	13.7

- Challenge: Create a regionally coordinated mechanism that contributes to the development of diversified development of RE Supply chains supported by bock chain technologies

A change framework –Future Vision for G20



From 2024 to 2050: How Does G20 Can Move forward with New Partnerships?

- **Dialogues and partnerships** that bring technology developers and providers together with environmental and energy experts to co-develop innovations for sustainability and resilience.
- **Innovative investment platforms, financing structure, and business models** that can accelerate the scaling of promising green innovations that could be supported by a combination of industry 4.0 set of technologies, regardless of whether they have clear commercial propositions or are less profitable sustainability and resilience benefits.
- **Regularly review and where appropriate revise emerging legislative and regulatory frameworks** to clarify and explicitly articulate the precise roles of new types of technologies increasing environmental sustainability benefits and strengthening the resilience capability of individual households and vulnerable communities
- **Partnership with international knowledge institutions** to enable the development of common and agile institutions and governance systems, including the championing of common policy principles for managing new technologies specific data protocols, and transparency mechanisms.

Thank You!

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