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South Asia Regional Initiative for Energy Integration

Session-4

Theme Presentation on

Creating Conducive Environment-Regional Investment Framework for Mobilizing Investment in Regional Energy Infrastructure projects in South Asia

Presented by

Rajiv Ratna Panda, Technical-Head, SARI/EI/IRADe

High Level Panel Discussion on Creating Conducive Environment for Investment in Regional Energy Infrastructures Projects in South Asia

Conference on “Regional Energy Integration and Cross Border Energy Trade: A New Renaissance for Growth and Development of South Asia Region” 19th February 2020, Hotel Imperial, New Delhi, India





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- ☐ ***Marco Economic Growth & Level of Economic Integration of South Asia***
- ☐ ***Success story of South Asia Energy/Power Sector***
- ☐ ***Challenges of South Asia Energy/Power Sector***
- ☐ ***Emerging Trends and Future Scenario***
- ☐ ***South Asia Energy/Power Sector: Investment Requirements***
- ☐ ***Opportunities and Challenges: Future Energy Investment***
- ☐ ***Regional Investment Framework***
- ☐ ***Points for Discussions***





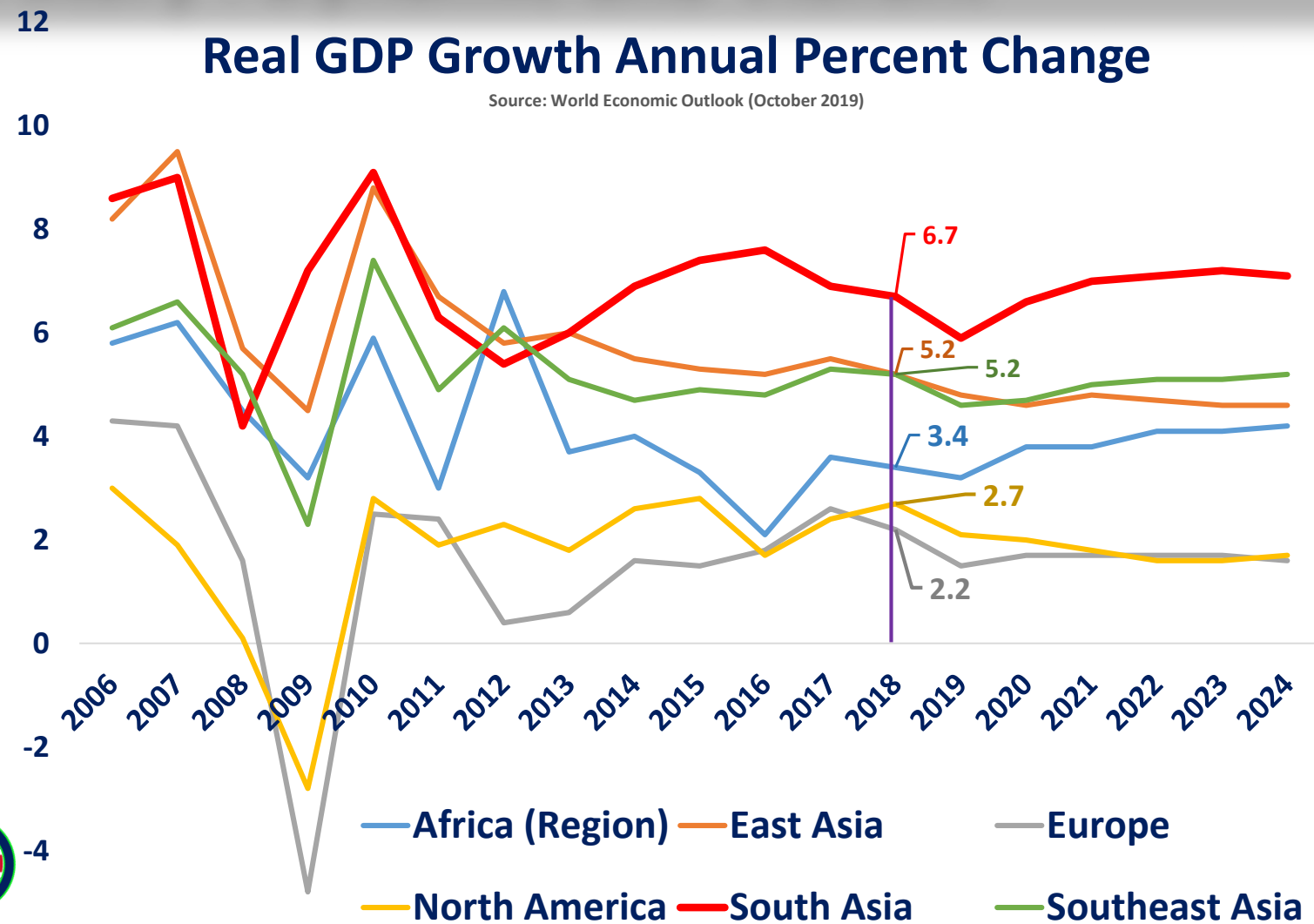
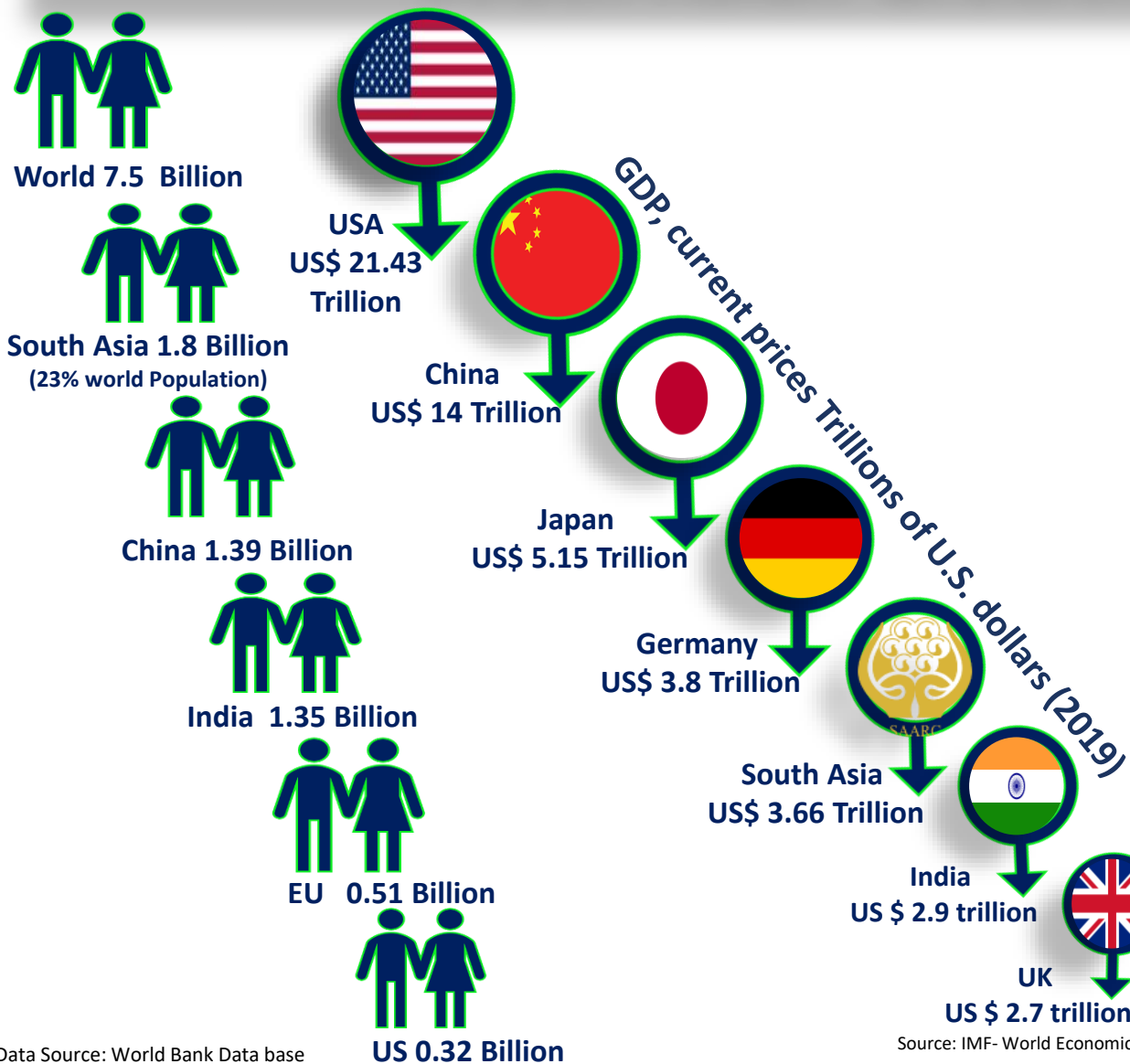
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Macro Economic Growth



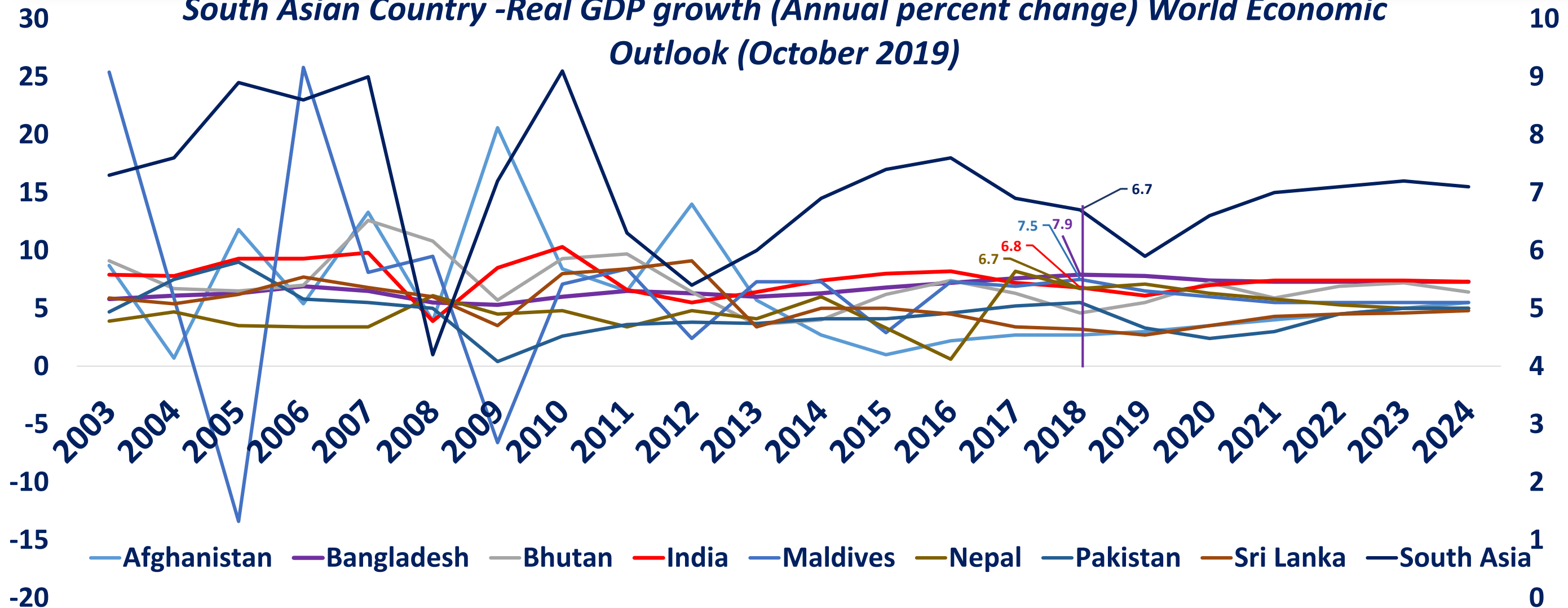
South Asian Growth Story : Dynamic and Vibrant



South Asia : Fastest growing region in the world and Expected to Remain So in future

South Asia : Robust Growth

South Asian Country -Real GDP growth (Annual percent change) World Economic Outlook (October 2019)

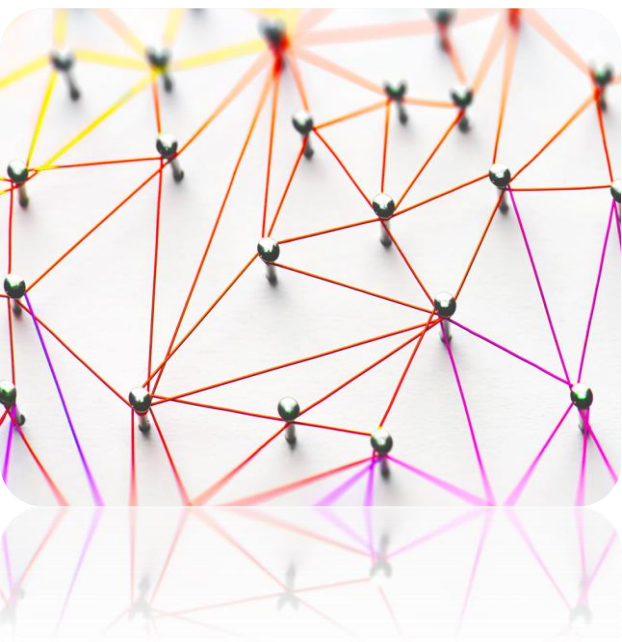


Source: IMF- World Economic Outlook (October 2019, https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/AFG/BGD/BDN/IND/MDV/NPL/PAK/LKA)

South Asia : Bangladesh, India—the fastest growing large economy among South Asian Countries



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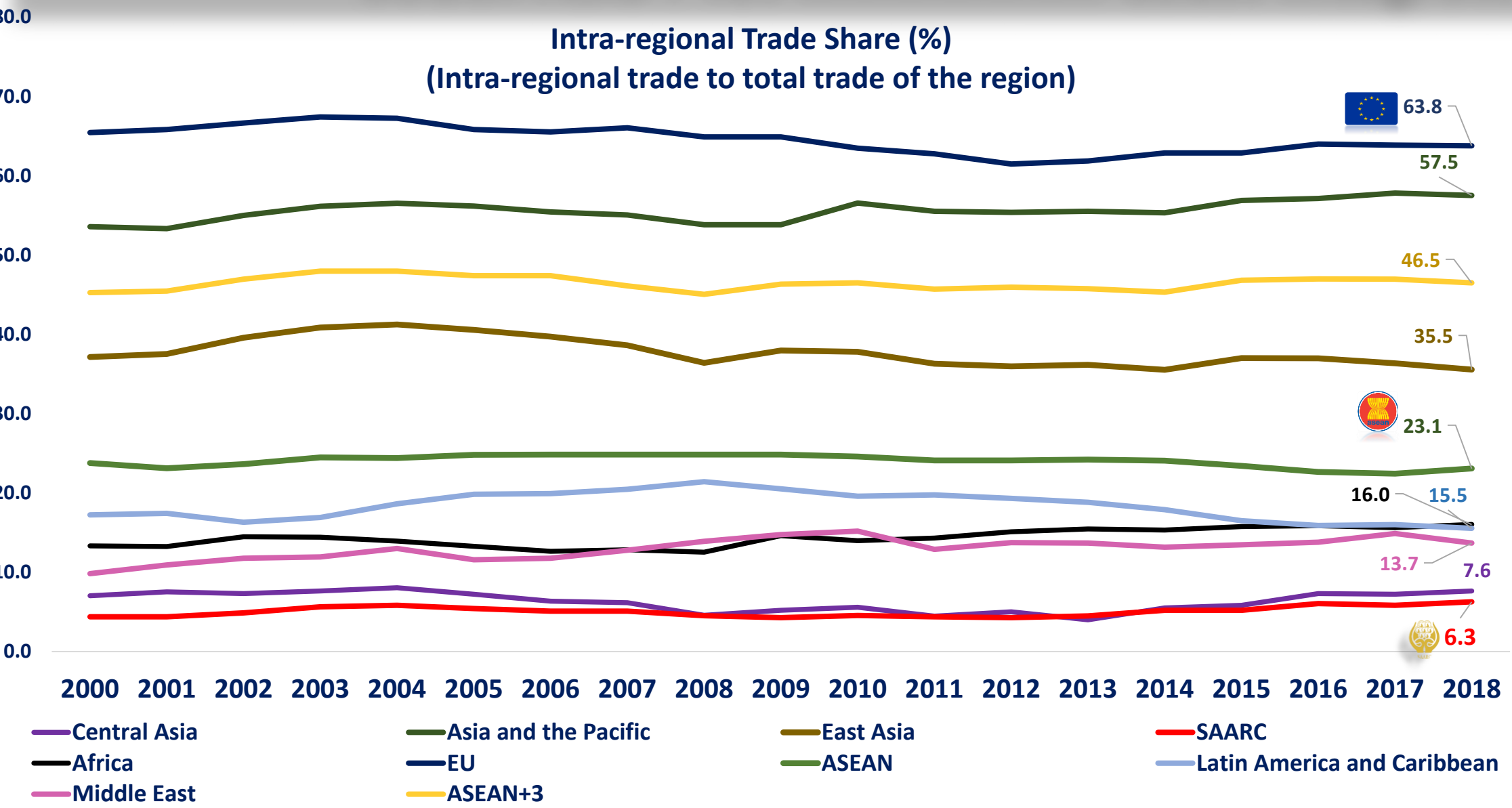


Economic Integration of South Asian Countries



South Asia : Yet Least Integrated

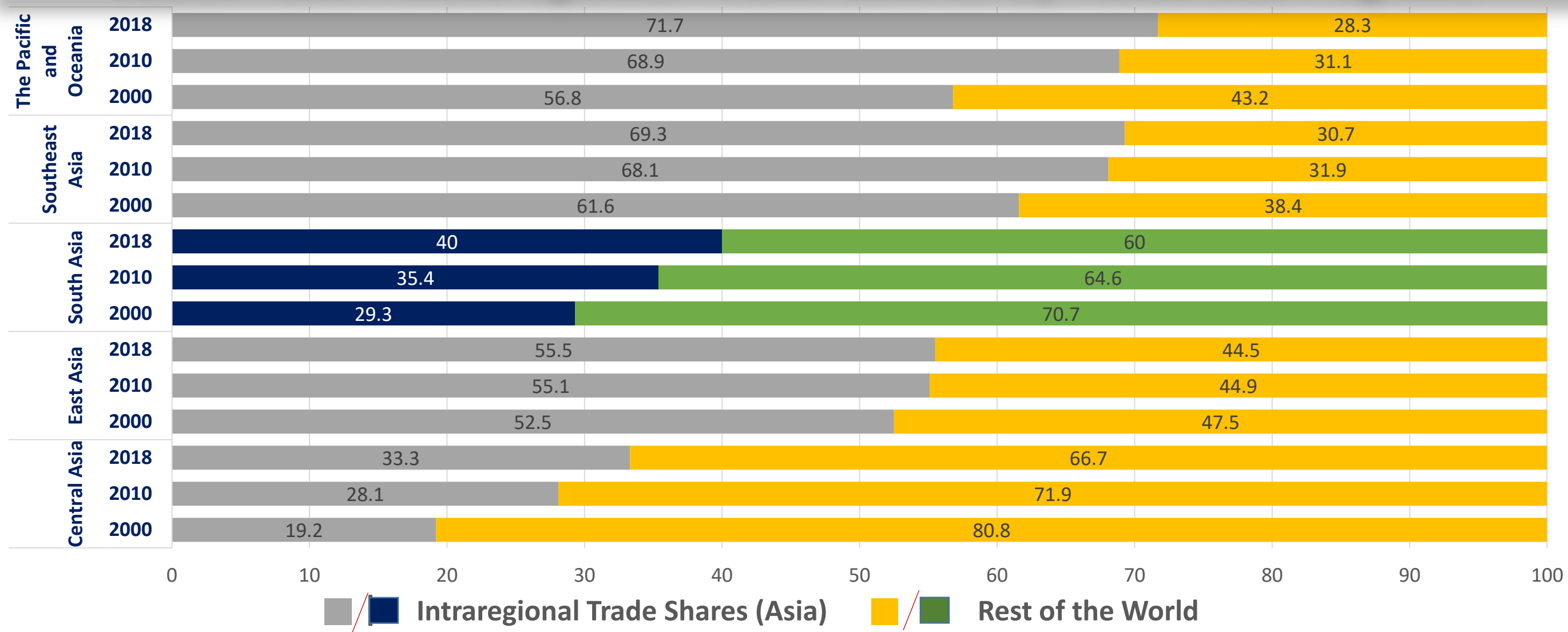
Intra-regional Trade Share (%)
(Intra-regional trade to total trade of the region)



Region	Intra-regional Trade Share (%) 2018
EU	63.8
Asia & Pacific	57.5
ASEAN+3	46.5
East Asia	35.5
ASEAN	23.1
Africa	16.0
Latin America & Caribbean	15.5
Middle East	13.7
Central Asia	7.6
SAARC	6.3

Source: The Integration Indicators Database <https://aric.adb.org/database/integration> ASEAN+3 consists of the 10 ASEAN member economies, the People's Republic of China (including Hong Kong, China), Japan, and the Republic of Korea.

South Asia : Intraregional Trade Shares by Asian Sub-regions



South Asia : Intra-regional trade (Asia) increased but is still low in comparison to other sub-regions of Asia



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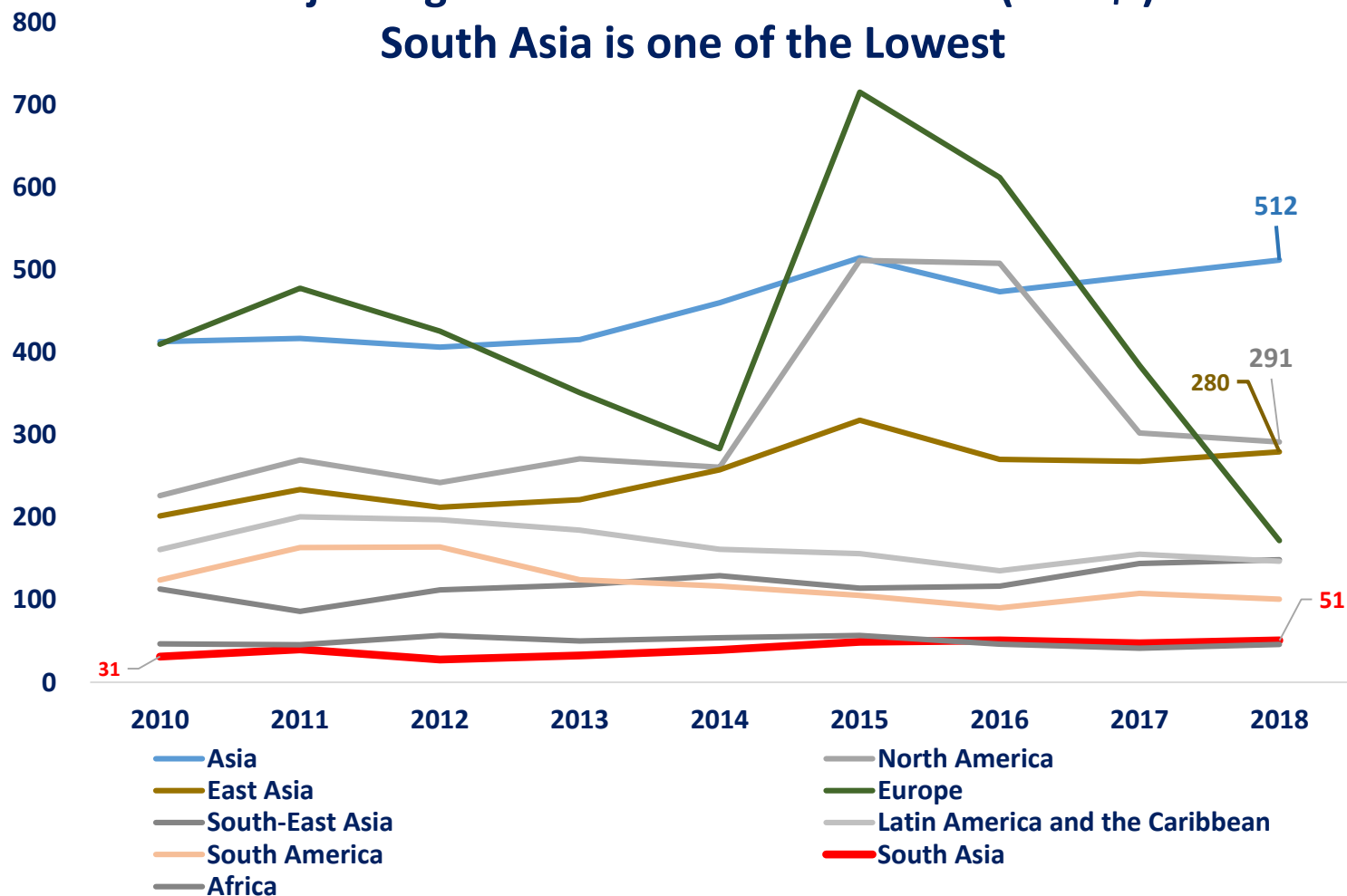


Key Investment Scenario in South Asia



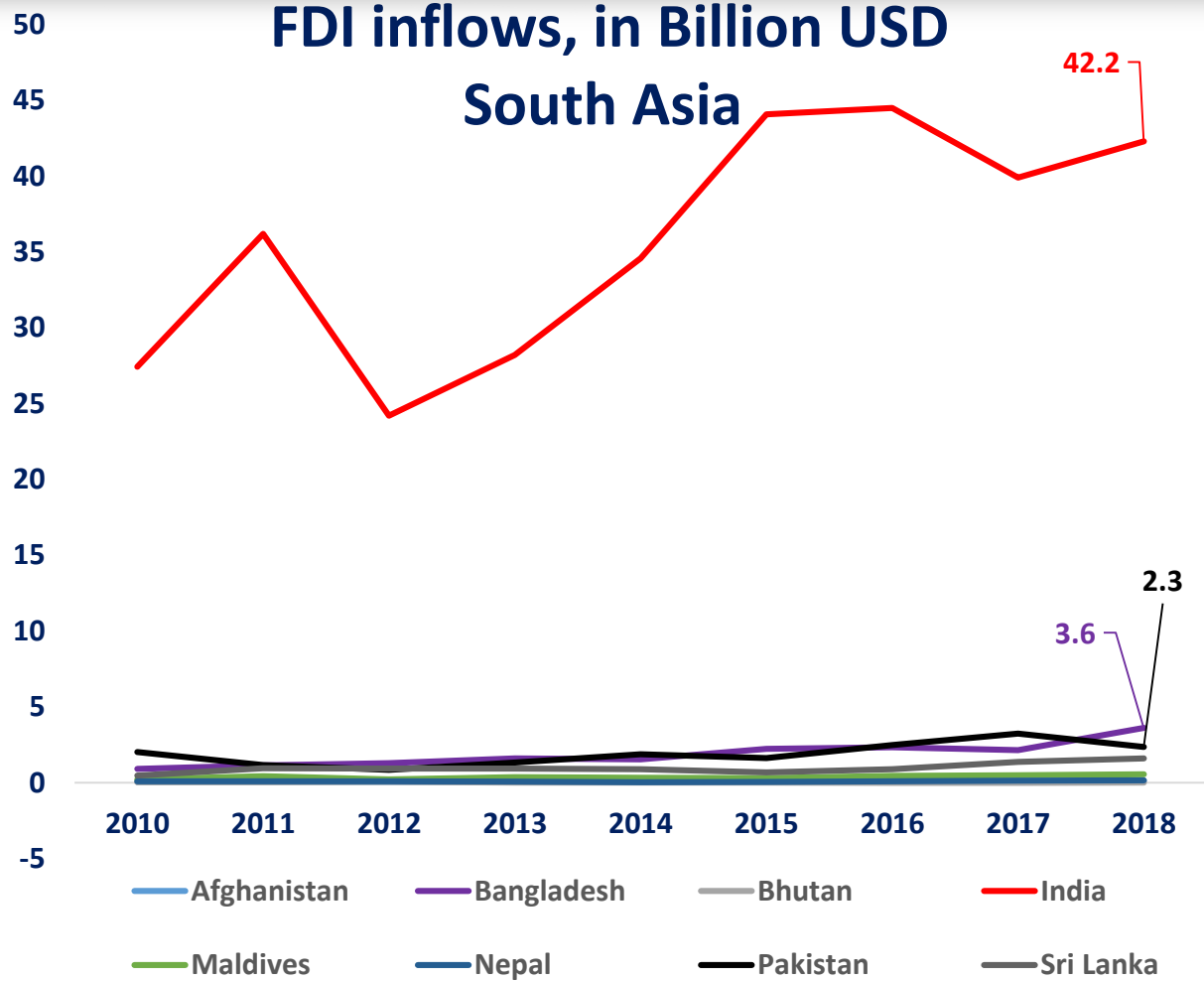
South Asia : FDI Inflows

Major Regions in the world FDI inflow(B US\$)
South Asia is one of the Lowest



Source : UNCTAD Database, accessed on 9-02-2020

FDI inflows, in Billion USD
South Asia

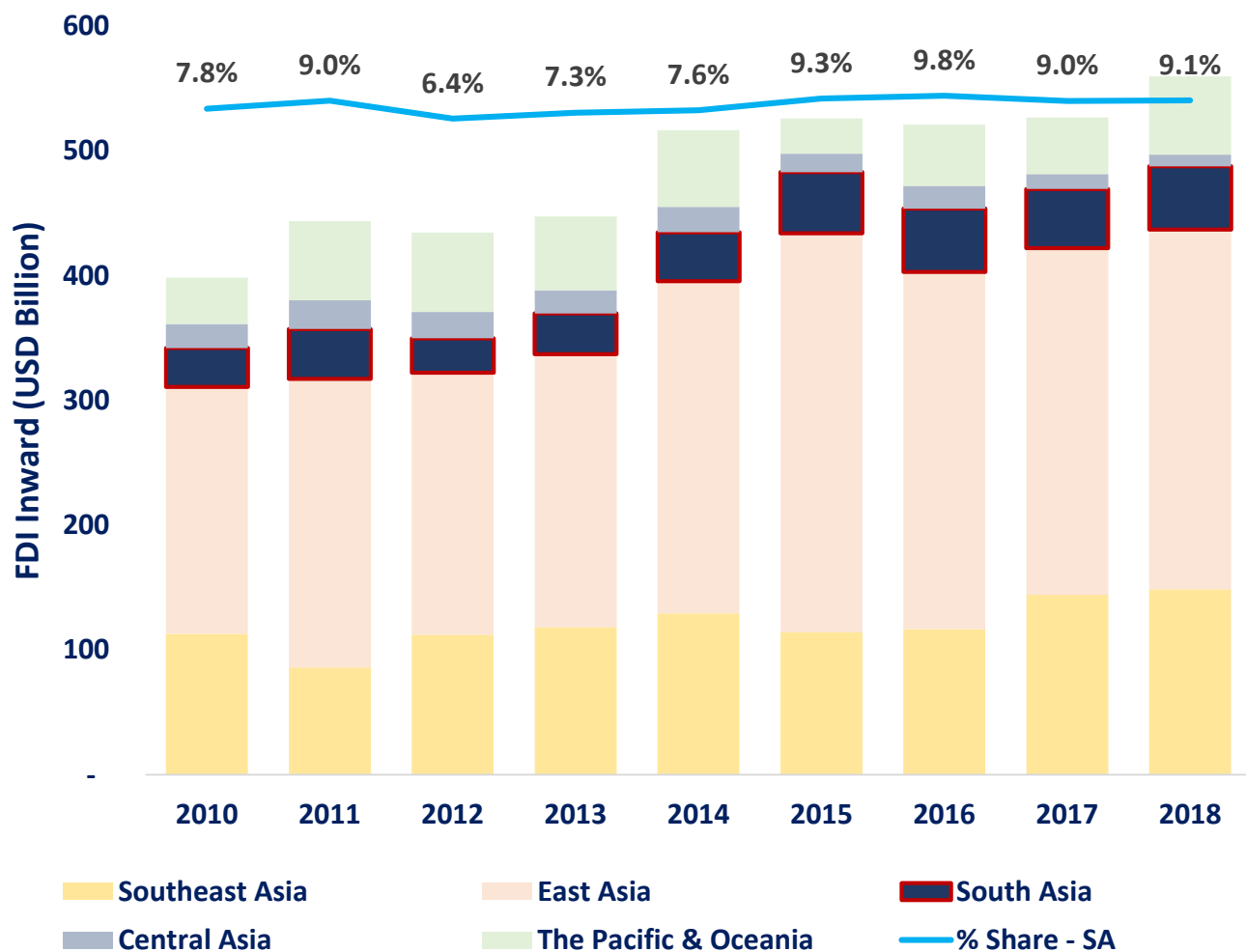


Source : UNCTAD Database, accessed on 9-02-2020

2018-India: 83% (42 B US \$) , Bangladesh 7% (3.6 B US \$), Pakistan 4% (2.3 B US \$)

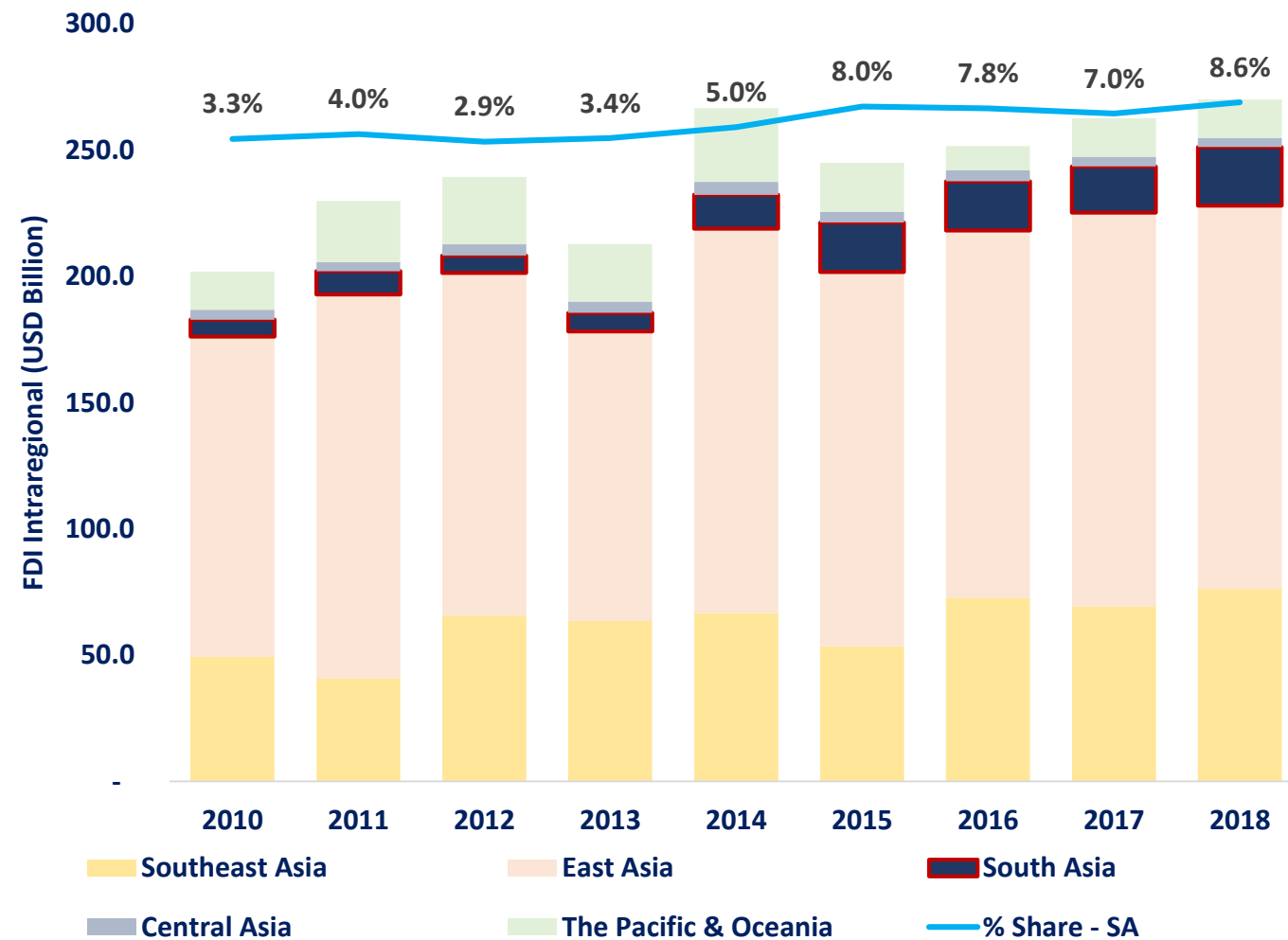
South Asia : FDI

Global Inward FDI to Asia by Destination Sub-region



South Asia : Share of FDI in Asia , 9.1 % , East Asia & South-east Asia Dominates

Intraregional FDI Inflows—Asia



South Asia : Share of Intraregional FDI in Asia , 8.6 % , East Asia & South-east Asia Dominates



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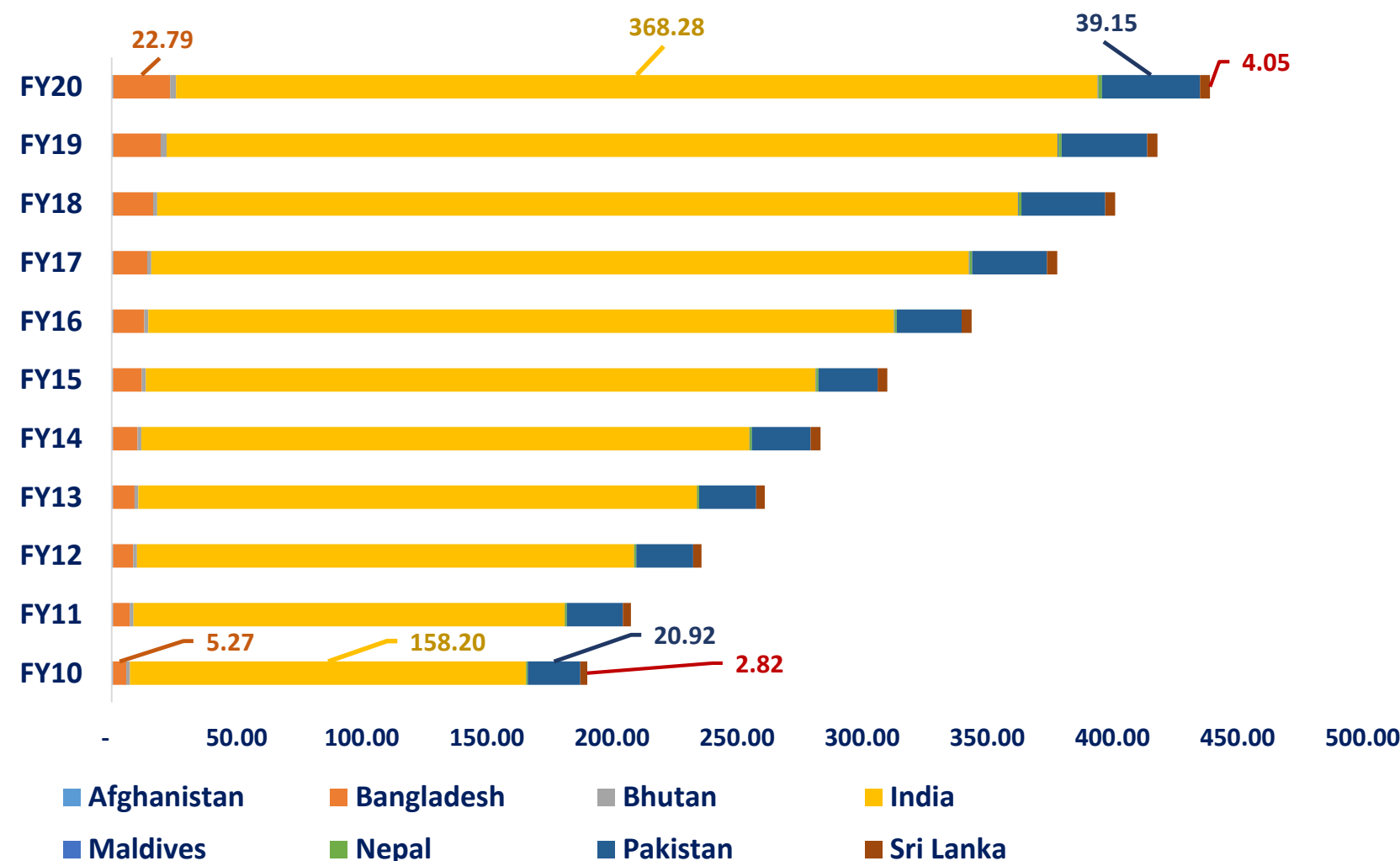


Energy/Power Sector Scenario : Success story of South Asia

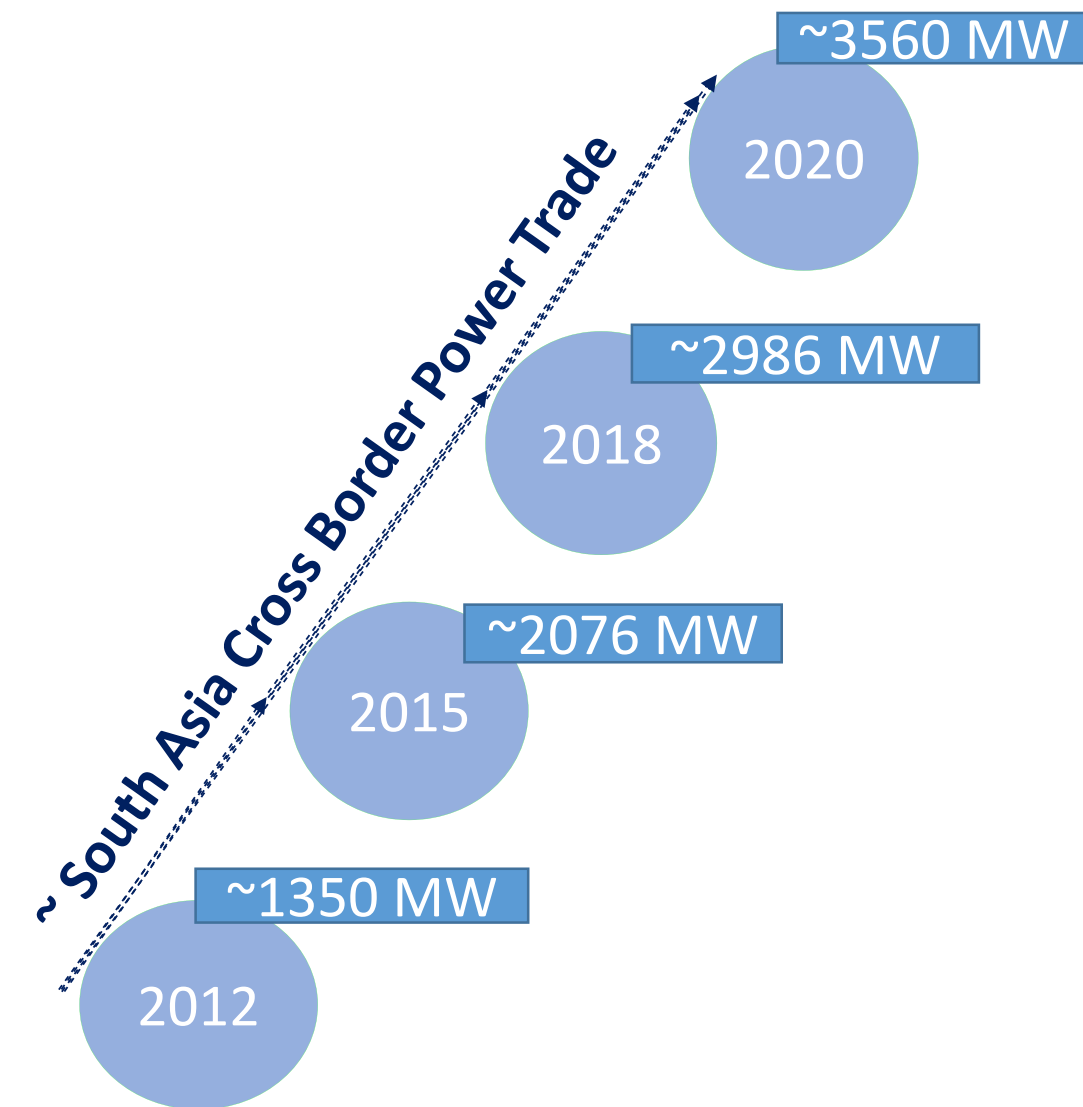


Energy/Power Sector Scenario : Success story of South Asia

Rapid Capacity Addition : Power Installed Capacity (GW)



Expansion in Cross Border Power Trade (MW)

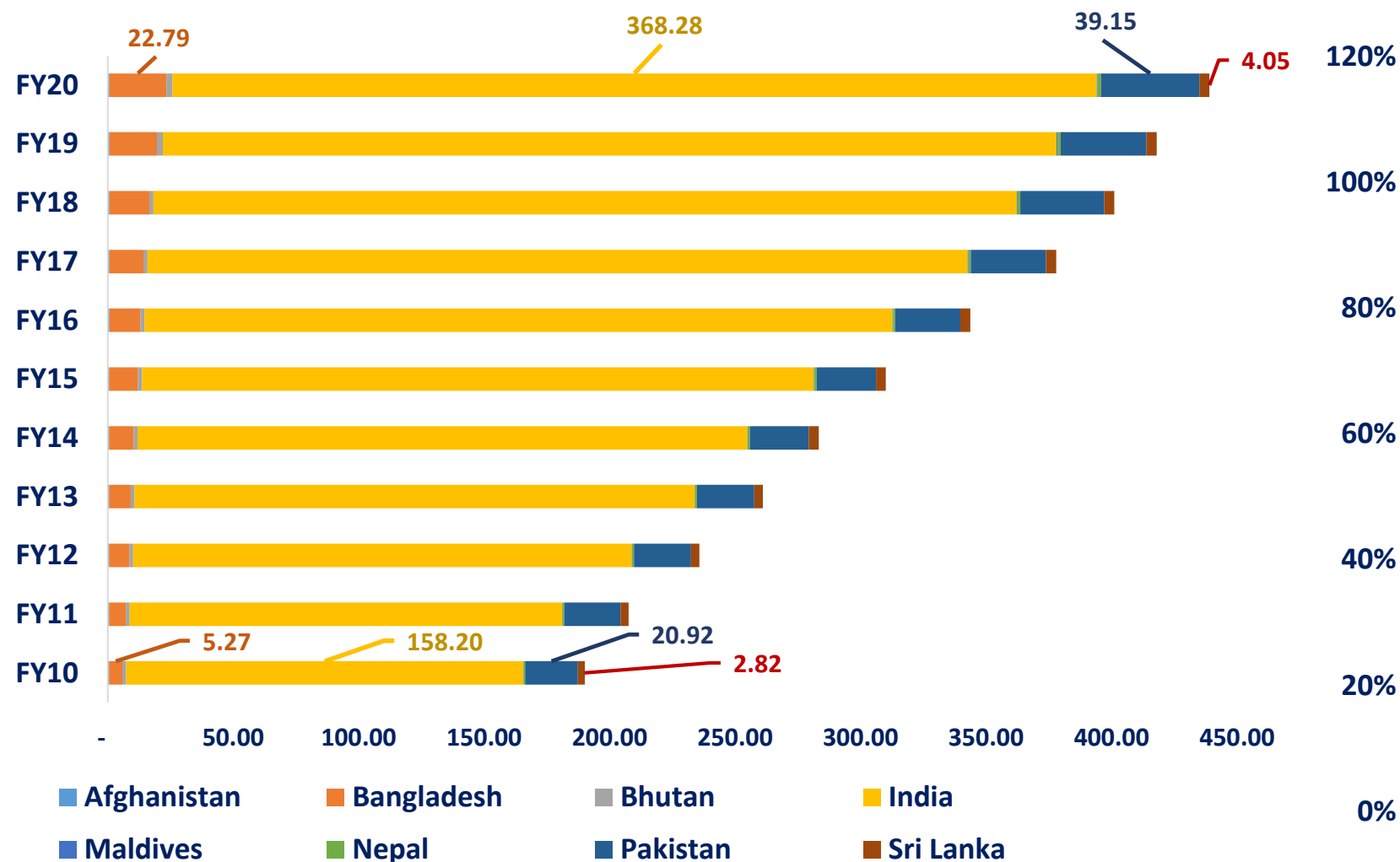


Bangladesh : 5.2 GW in 2010 to 22.8 GW by 2020, India : 158 GW in 2010 to 368 GW by 2020, Pakistan : 20.9 GW in 2010 to 39 GW by 2020

Source: Compiled from Various Sources, PM Modi inaugurated Mangdechhu hydroelectric plant, Bhutan, Aug 17, 2019
 Considered Regional India-Myanmar ~8.5 MW of CBET, Pakistan-Iran ~104 MW CBET, Afghanistan-Imports around 1000 MW collectively from Uzbekistan (326 MW), Iran (164 MW), Tajikistan (433 MW), Turkmenistan (77 MW), Source: <https://www.pwv.com/india-myanmar-energy-cooperation/>

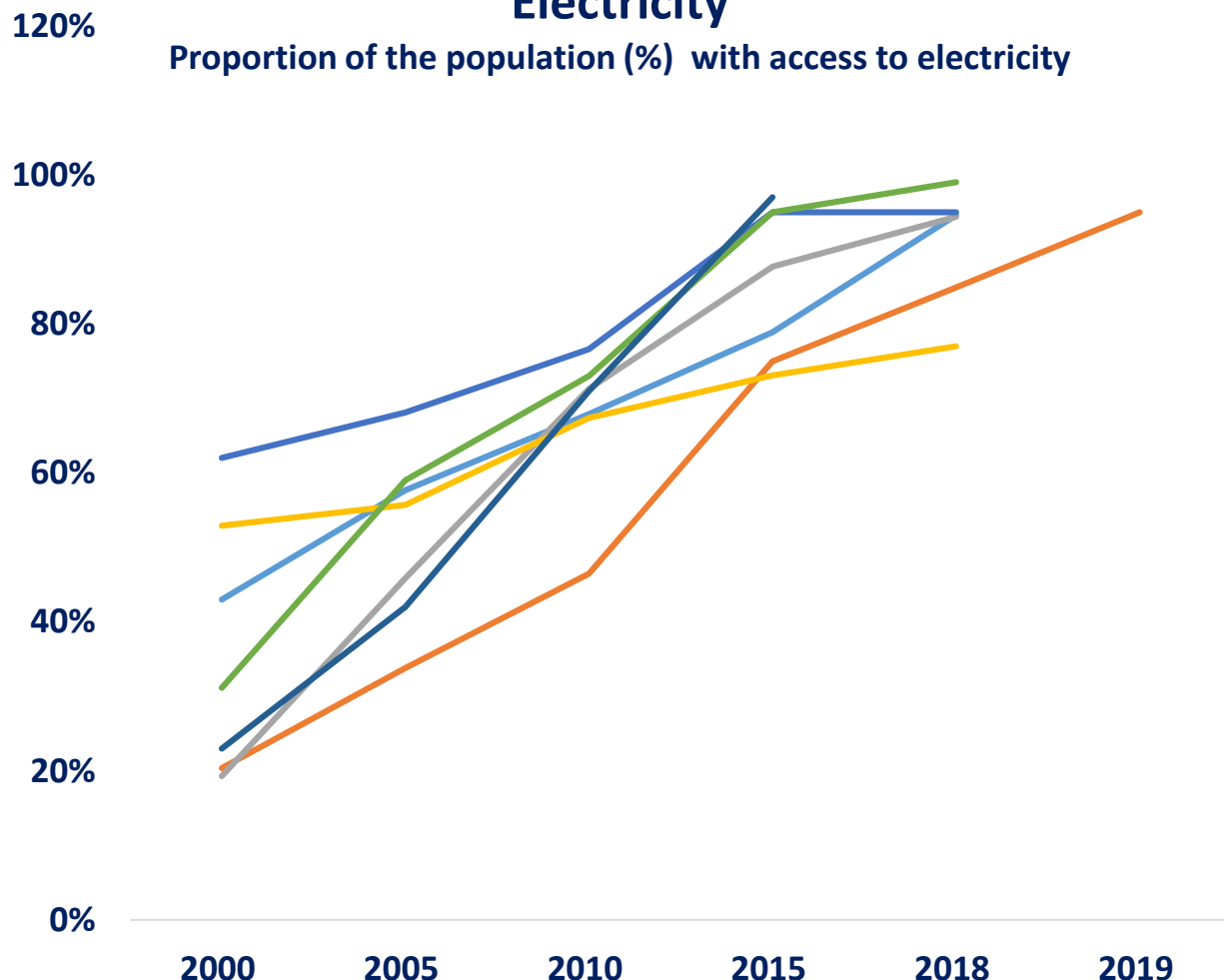
Energy/Power Sector Scenario : Success story of South Asia

Rapid Capacity Addition : Power Installed Capacity (GW)



Significant Achievement in Access to Electricity

Proportion of the population (%) with access to electricity



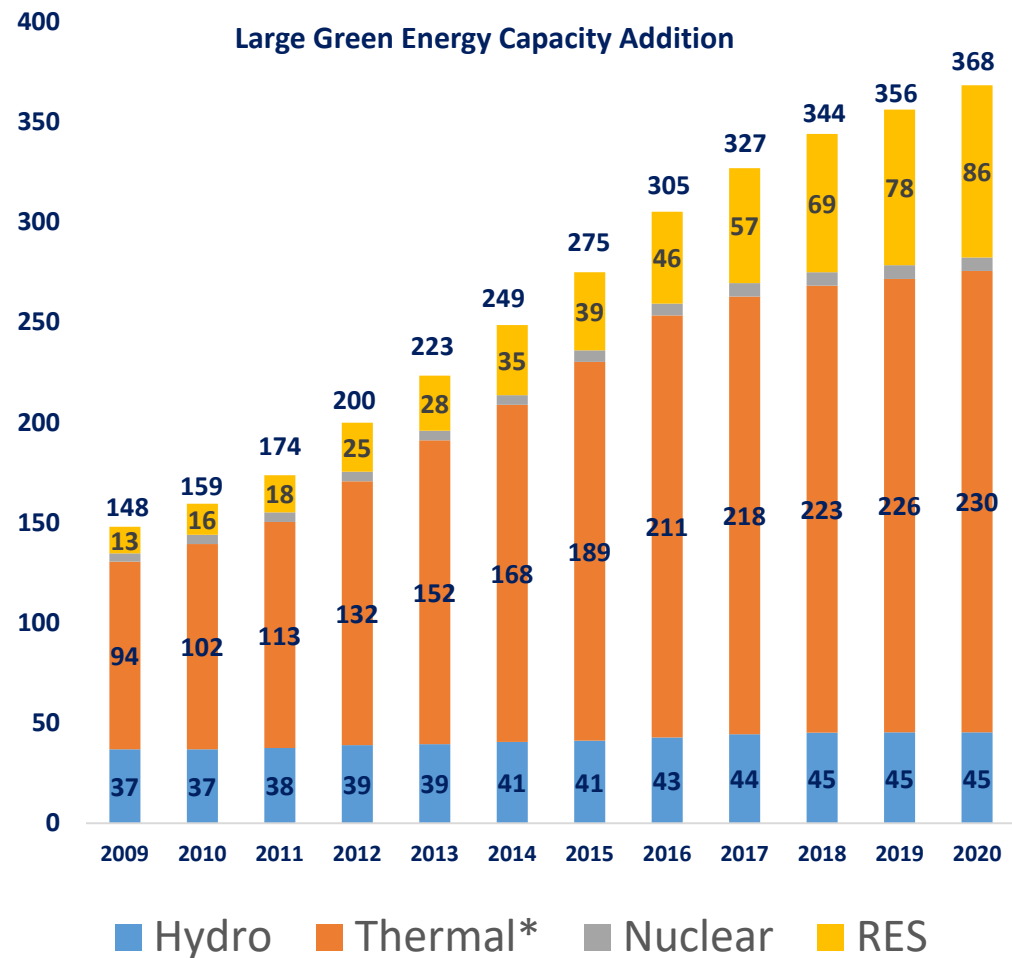
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Source: Compiled from various sources - IEA, World Energy Outlook-2019, <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=BT-MV-IN-LK-AF-PK-NP-BD>

Energy/Power Sector Scenario : Success story of South Asia

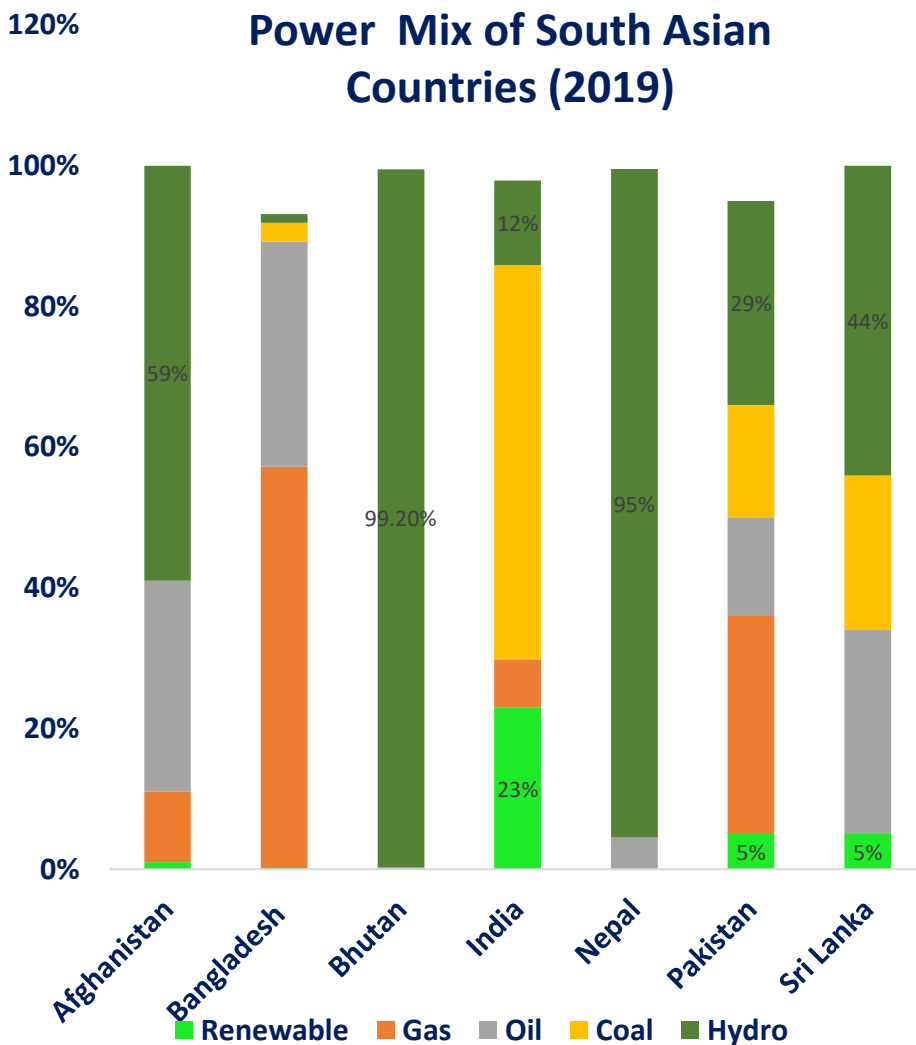
India Electricity Installed capacity Growth (GW)

Large Green Energy Capacity Addition



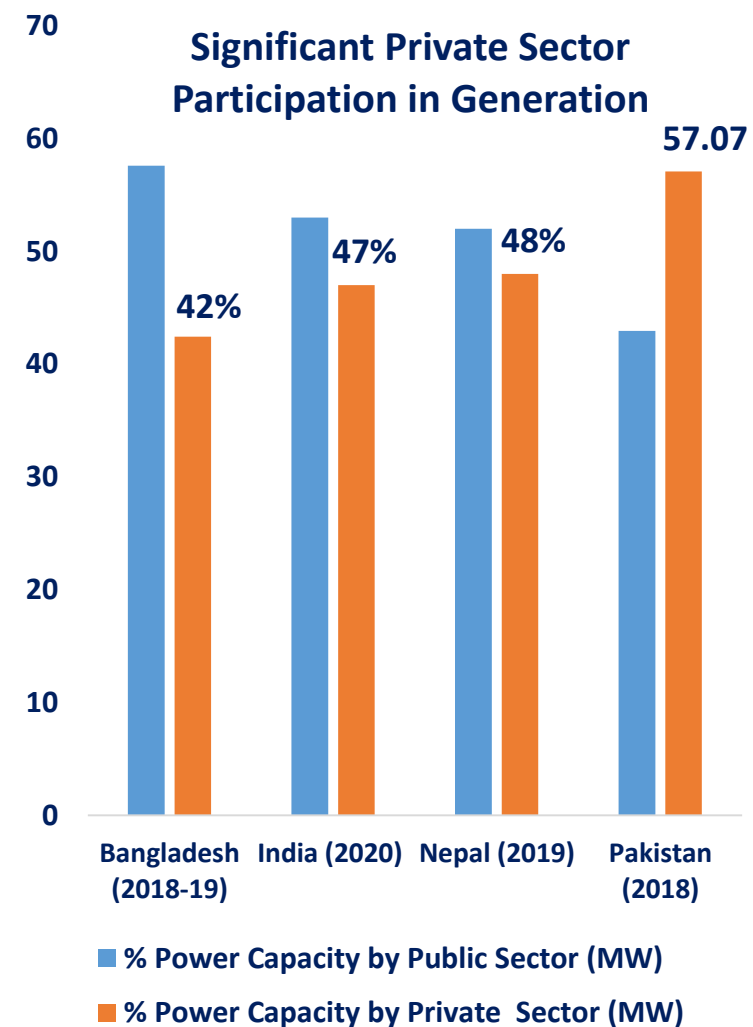
**Green Has been Growing in SA countries,
India: 13 GW in 2009 to 86 GW in 2020**

Power Mix of South Asian Countries (2019)



**Green Energy (RE+ Hydro) in most of the
Countries**

Significant Private Sector Participation in Generation



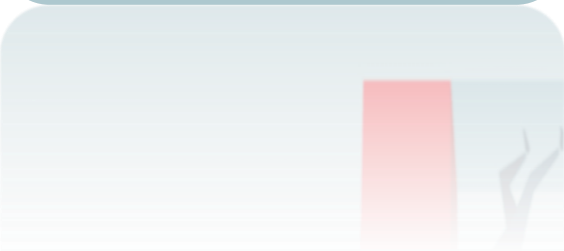
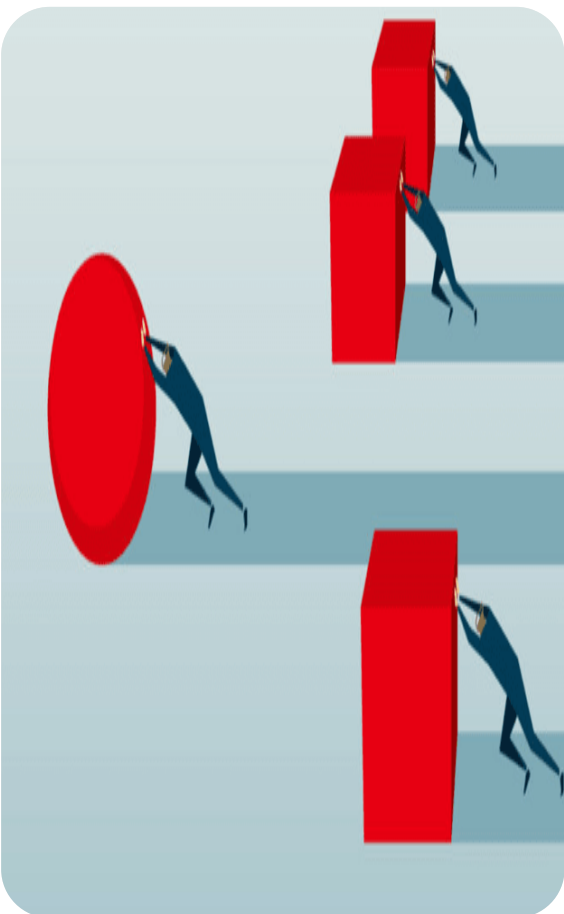
**Bangladesh -42%, India , 47%,
Nepal-48%, Pakistan-57%**



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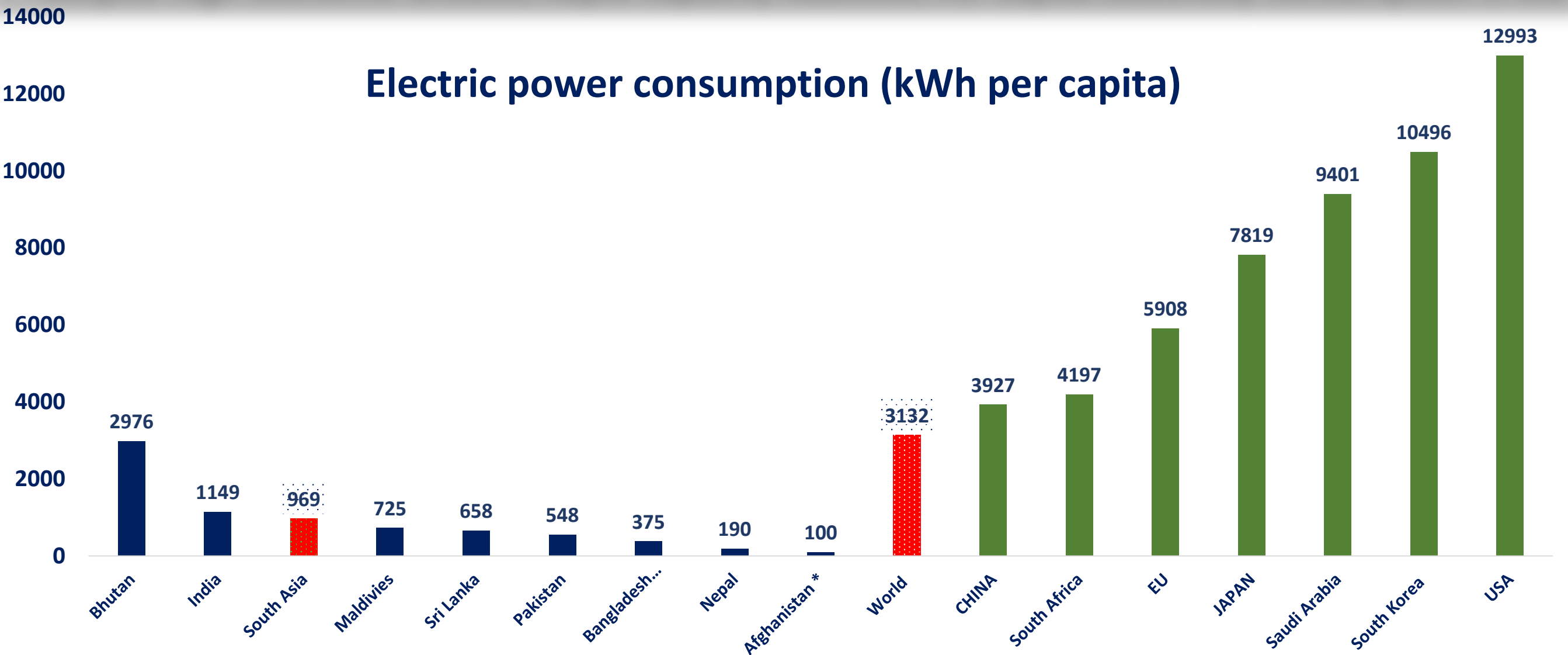


Energy/Power Sector Scenario : Challenges



Despite High Economic Growth, Rapid Capacity Addition, Per Capita Electricity Consumption is low

Electric power consumption (kWh per capita)



Source: Compiled and Calculated from various sources | [Bhutan](#) , [India](#), [Sri Lanka](#), [Pakistan](#), [Bangladesh](#)**, [Nepal](#), [Afghanistan *](#) [Maldives](#) | Afghanistan, Bhutan and Nepal are calculated values | USA , South Korea , Saudi Arabia, JAPAN, EU, South Africa, CHINA –data is 2014 world Bank database.

Quality is a Concern, reliability and availability of Electricity infrastructure

Economy	% of firms experiencing electrical outages	No. of electrical outages in a typical month	If there were outages, average duration of a typical electrical outage (hours)	If there were outages, average losses due to electrical outages (% of annual sales)	Percent of firms owning or sharing a generator	If a generator is used, average proportion of electricity from a generator (%)	Days to obtain an electrical connection (upon application)	% of firms identifying electricity as a major constraint
All Countries	58.4	6	4.5	4.3	35	18.4	34.8	32.8
East Asia & Pacific	56.8	4.2	3.4	3	35	16.2	18	18.2
Europe & Central Asia	31.4	0.8	3	1.2	18.7	8.3	35.6	21.9
Latin America & Caribbean	64.8	2.1	2.7	1.7	26	14.5	32.1	36.6
Middle East & North Africa	50.2	13.8	8.7	5.1	41.3	26.8	53.1	37.8
South Asia	66.2	25.4	5.3	10.9	45.4	24.4	55.1	46.1
Sub-Saharan Africa	76.2	8.3	6.4	7.8	51	26.9	35.4	41.2

South Asia : reliability & availability of Electricity infrastructure is concern. Need to focus on Quality

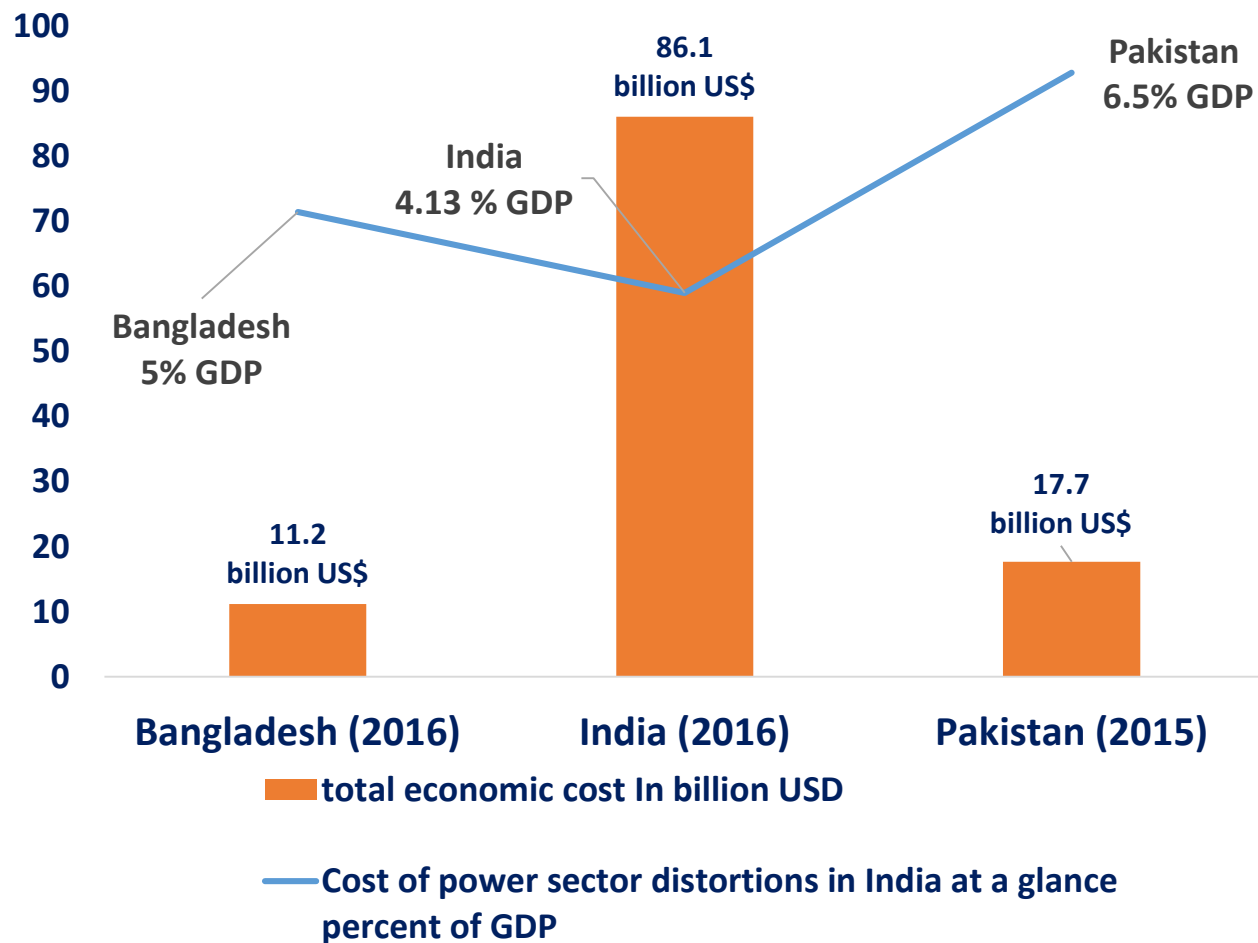
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South Asia	66.2	25.4	5.3	10.9	45.4	24.4	55.1	46.1
Afghanistan	70.4	11.5	3.8	9.6	48	38.3	111.3	65.8
Bangladesh	73.4	64.5	1.2	5.5	62.8	26.1	84.7	52
Bhutan	44.2	0.4	8.1	3.7	9.5	10.2	21.3	14.1
India	55.4	13.8	2	3.7	46.5	8.8	21.9	21.3
Nepal	62.8	8.7	3.6	17	50.5	41.3	21.3	68.8
Pakistan	81.1	75.2	16.9	33.8	65.4	41.4	82.8	75.3

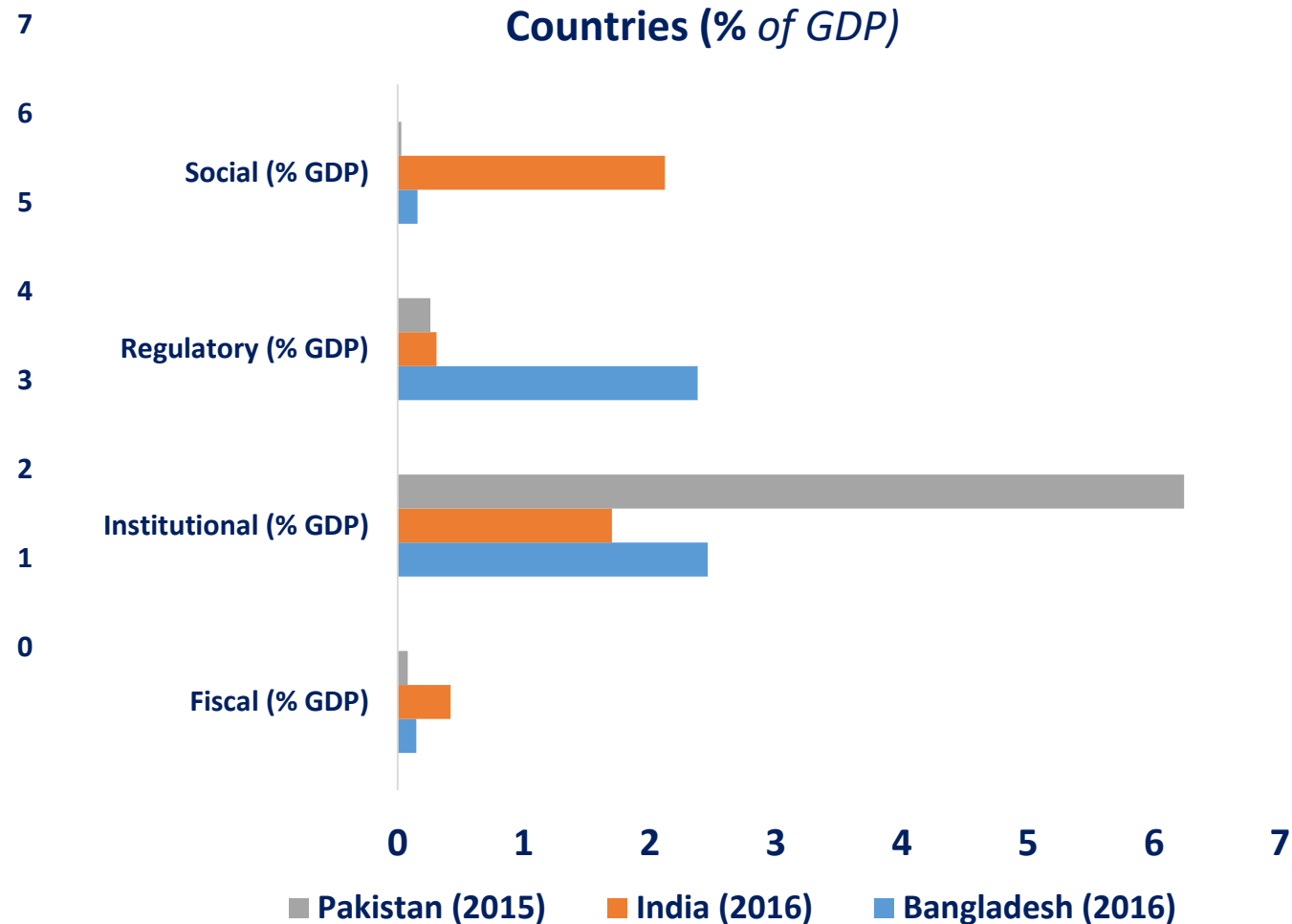
Varies among South Asian Countries

Cost of power sector distortions in South Asia

Cost of power sector distortions in South Asia



Cost of power sector distortions in South Asian Countries (% of GDP)



Cost of power sector distortions in South Asia: Bangladesh-11.1 Billion US\$, India-86.1 Billion US\$, Pakistan-17.7 Billion US\$



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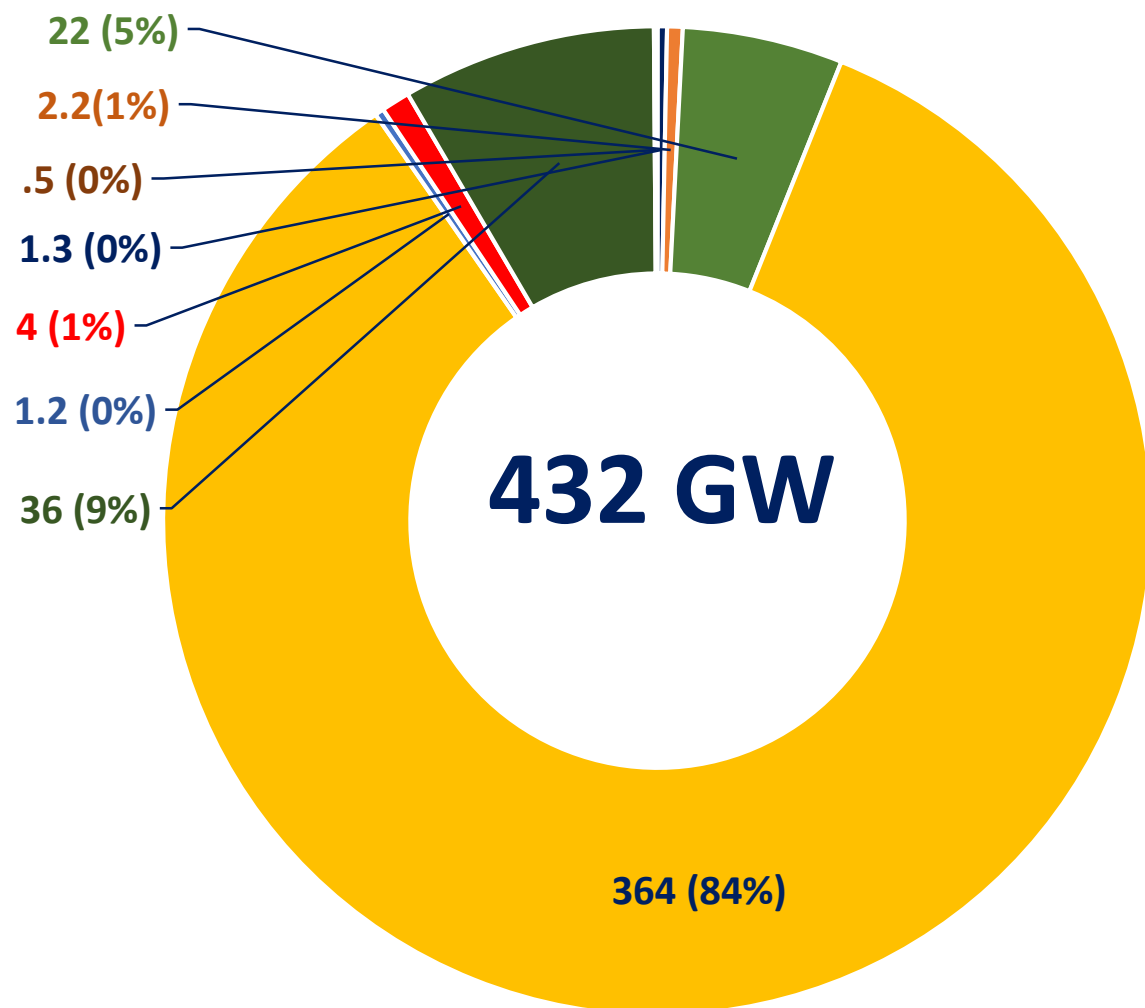


South Asia Energy/Power Sector: Emerging Trends and Future Scenario



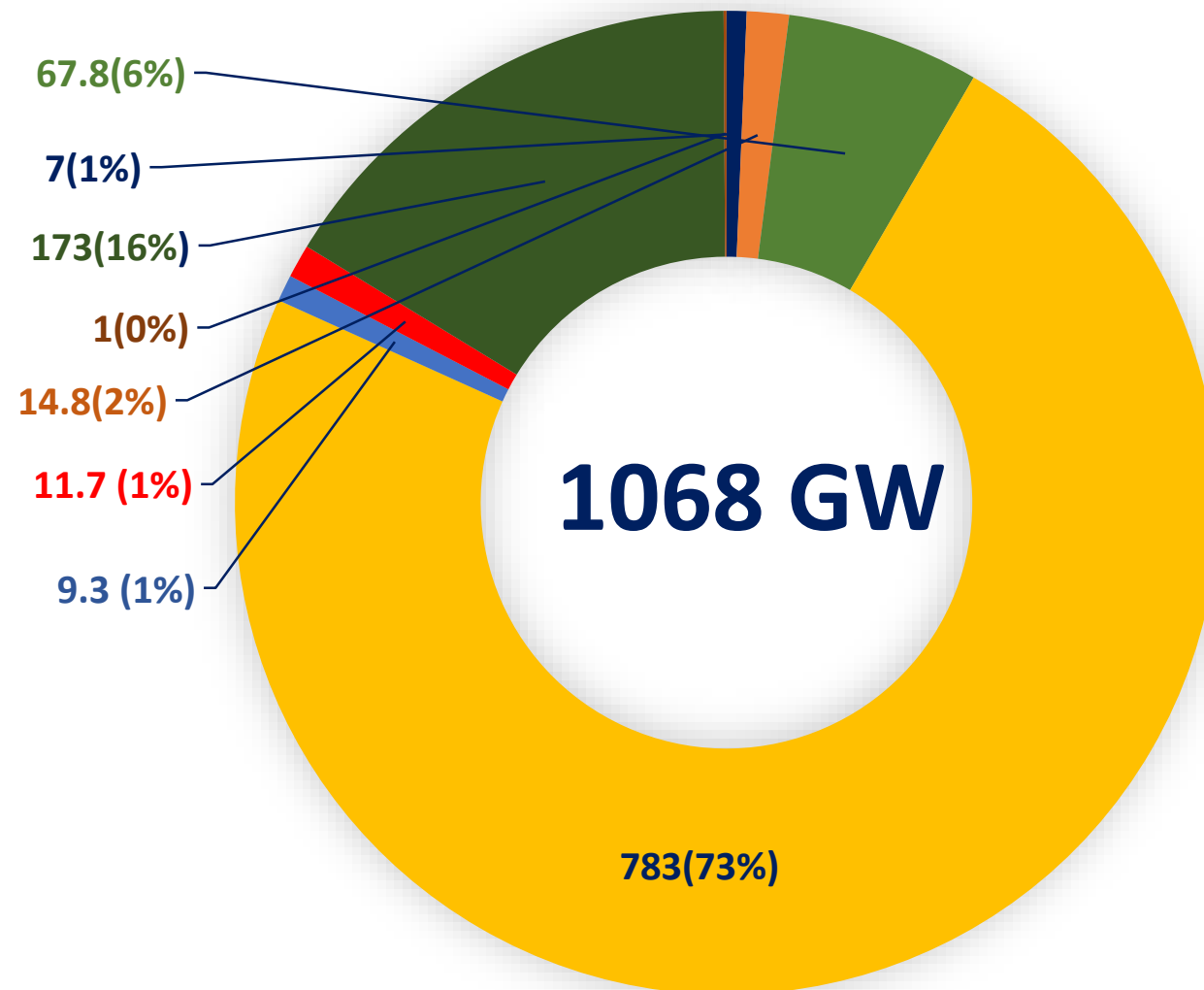
South Asia Power Sector: 1068 GW by 2040

Current South Asia-Power Installed Capacity (GW)



■ Afghanistan (2017) ■ Bhutan(2019) ■ Bangladesh(2019) ■ India (Nov-2019)
■ Nepal (2019) ■ Sri Lanka (2018) ■ Pakistan (2018) ■ Maldivies (2017)

South Asia Power Installed Capacity (GW)-2040*

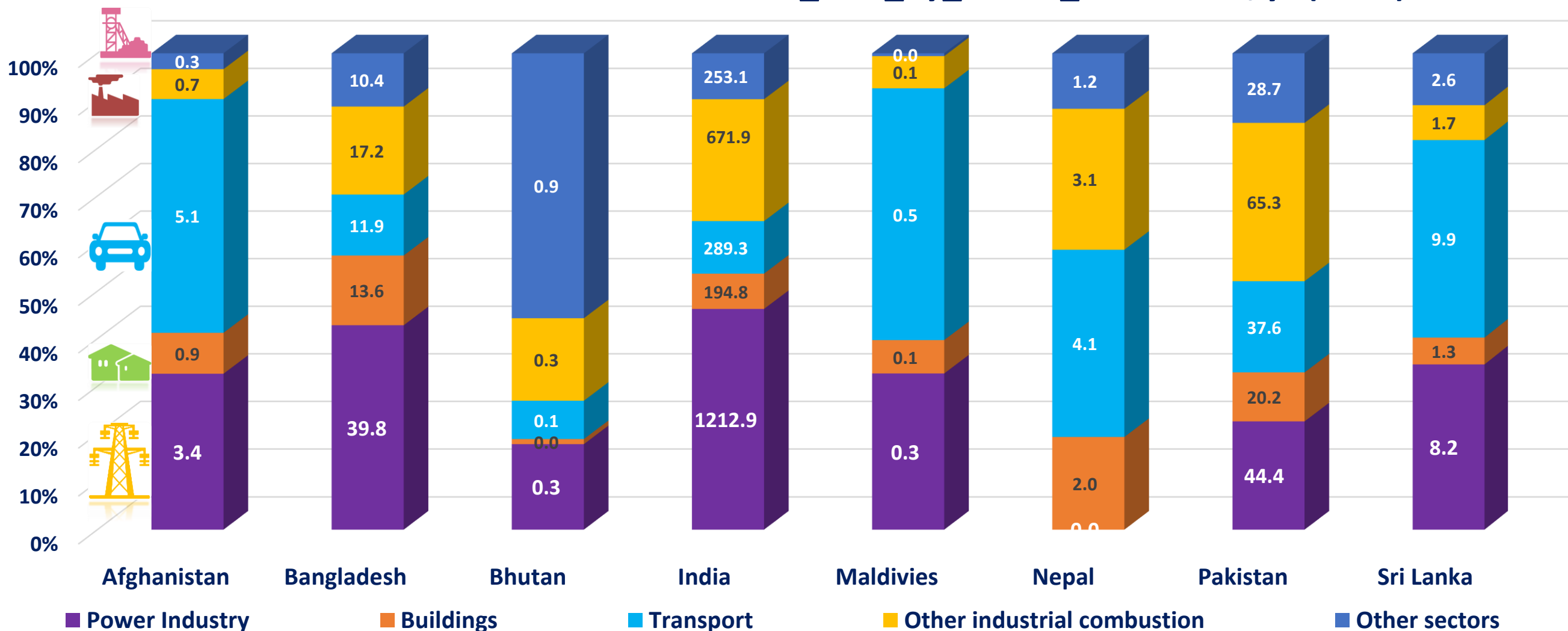


■ Afghanistan ■ Bhutan ■ Bangladesh ■ India ■ Nepal ■ Sri Lanka ■ Pakistan ■ Maldivies

* Projection as per the World Bank Report on "[How Much Could South Asia Benefit from Regional Electricity Cooperation and Trade?](#)" For Maldives 1000 MW of capacity is Assumed by 2040.

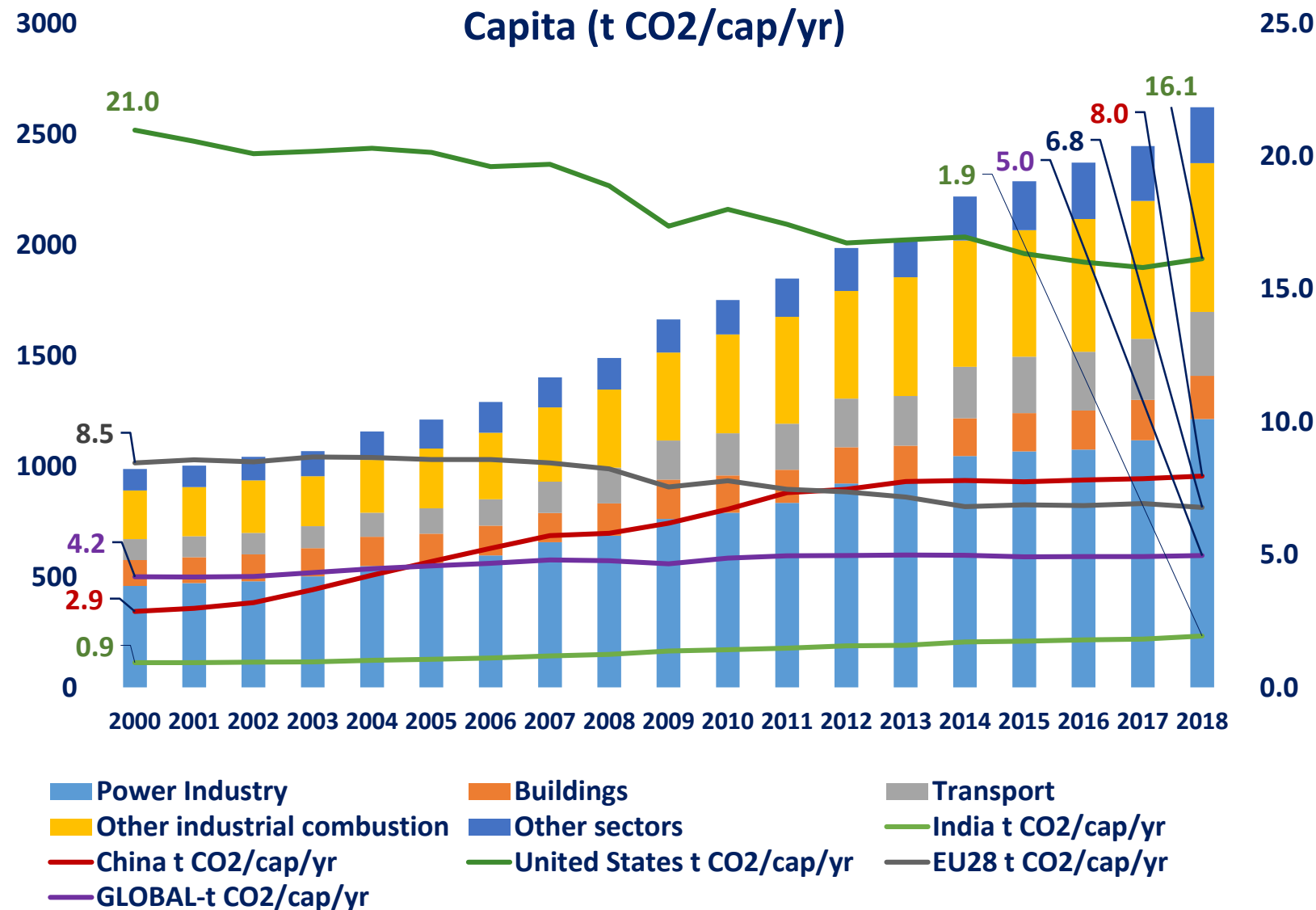
SAARC -Significant Environment/Climate Change Challenge

SAARC Countries-fossil_CO2_by_sector_ in Mt CO2/yr (2018)

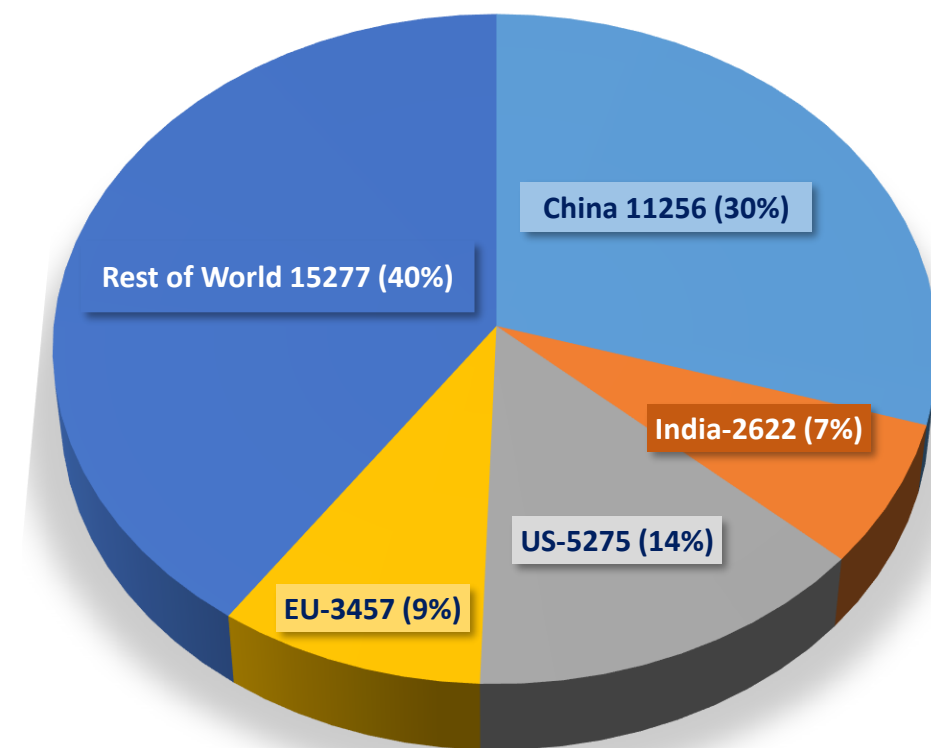


SAARC -Significant Environment/Climate Change Challenge

Fossil CO2 Emission by Sector-India (Mt CO2/yr) & Per Capita (t CO2/cap/yr)



**Fossil CO2 Emission in Mt CO2/yr (% Share)
4 Nations -60% Global Emission**

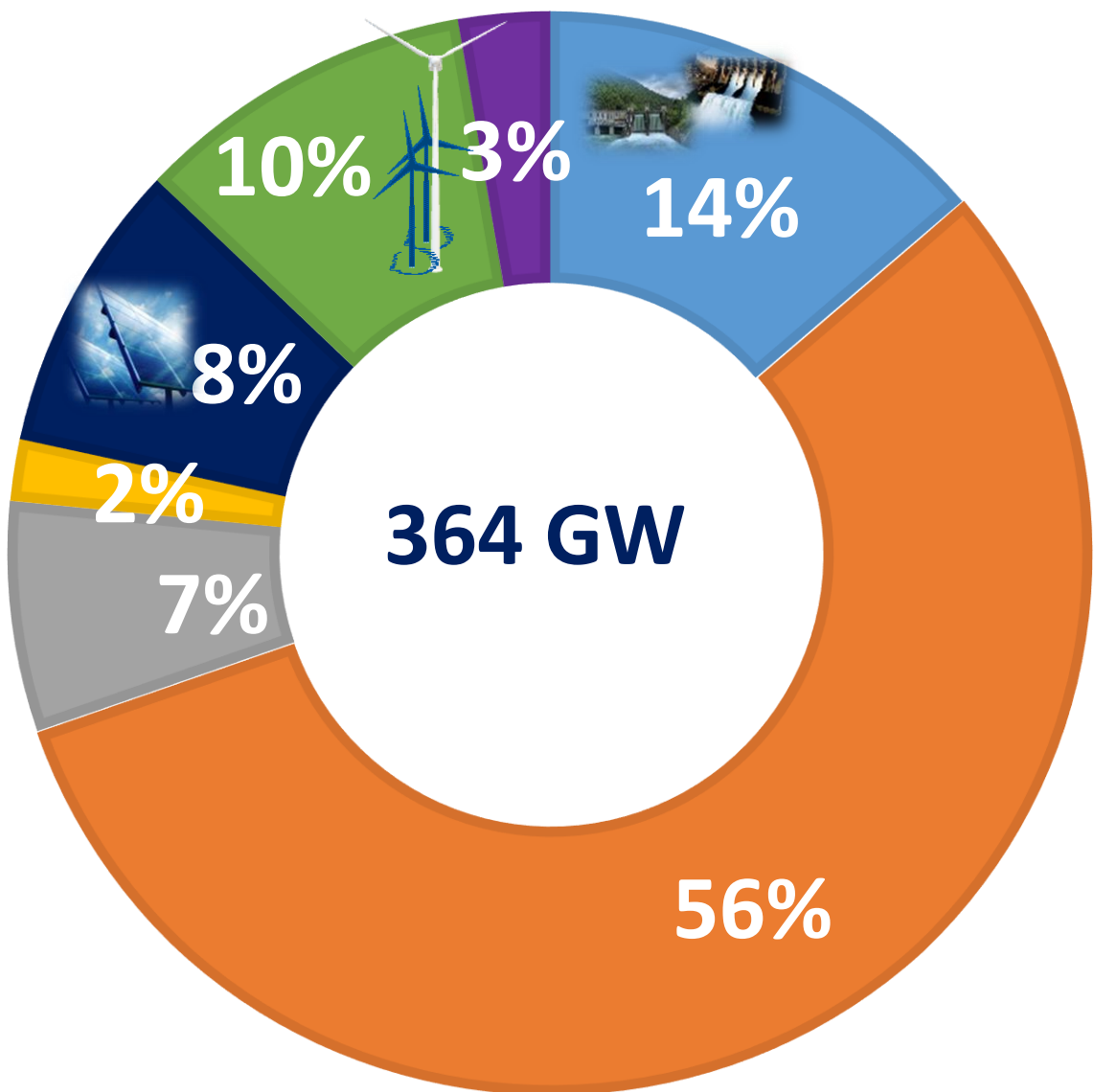


- China
- India
- United States
- EU28
- Rest of the World

source: [Climate Emergency CoP 25: India is the only major economy to be '2 degree compatible'](https://www.climate-emergency.co.uk/2019/02/19/india-is-the-only-major-economy-to-be-2-degree-compatible/) , Fossil CO2 and GHG emissions of all world countries 2019 Report-JRC SCIENCE FOR POLICY REPORT https://edgar.jrc.ec.europa.eu/booklet2019/Fossil_CO2andGHG_emissions_of_all_world_countries_booklet_2019report.pdf



INDIA POWER INSTALLED CAPACITY (MW) IN OCT. 2019



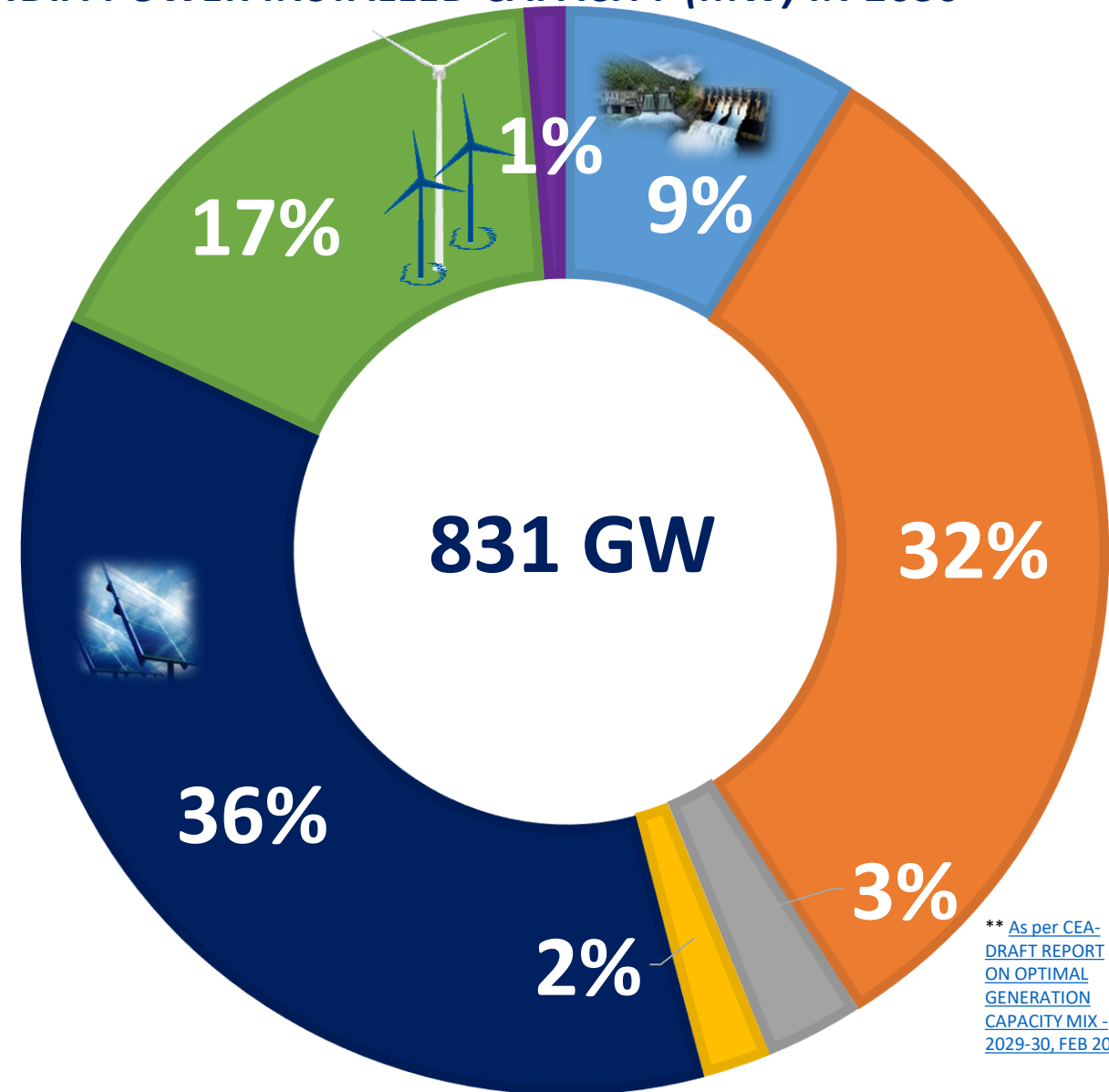
364 GW

■ Hydro * ■ Coal + Lignite ■ Gas ■ Nuclear
■ Solar ■ Wind ■ Biomass

RES (Hydro+ Solar+ Wind)= 118 GW (32%) RES (Solar+ Wind)=68 GW (18%)

* including small hydro

INDIA POWER INSTALLED CAPACITY (MW) IN 2030 **



831 GW

■ Hydro * ■ Coal + Lignite ■ Gas ■ Nuclear
■ Solar ■ Wind ■ Biomass

RES (Hydro+ Solar+ Wind)= 513 GW (62%) RES (Solar+ Wind)=440 GW (53%)

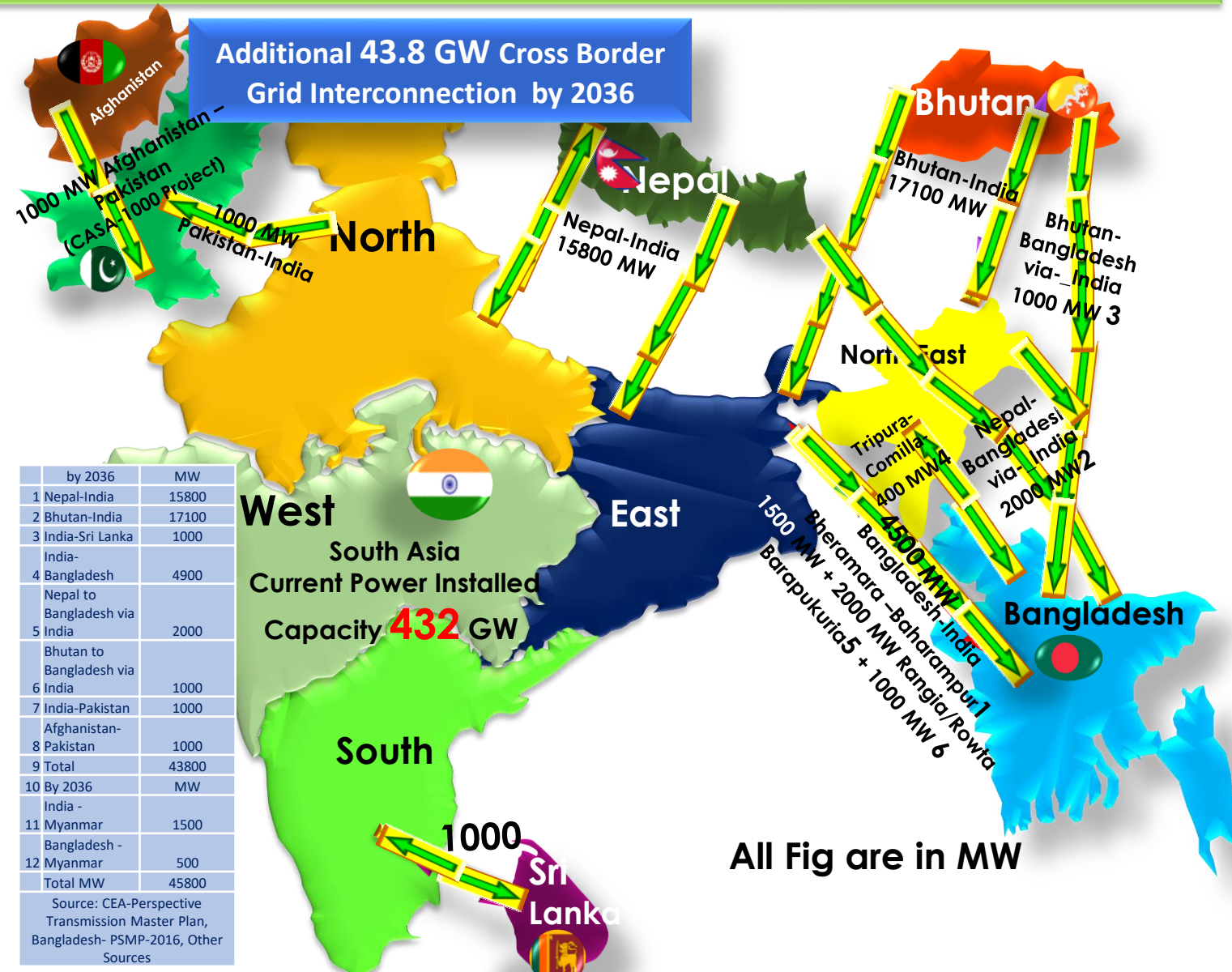
** As per CEA-
DRAFT REPORT
ON OPTIMAL
GENERATION
CAPACITY MIX -
2029-30, FEB 2019

* including small
hydro of 5000 MW
and hydro imports
of 4356 MW

Expansion in Cross Border Power Trade (MW) & Future Transmission Capacity- 2036/2040

□ Rapid Expansion is envisaged.

□ 43.8 GW of cross border Grid Interconnection by 2036.



Compiled from [CEA-Perspective Transmission Master Plan, Bangladesh- PSMP-2016](#), Other Sources 1 Bangladesh-India Bheramara –Baharampur-Existing 500 MW

2 From Nepal 1,000 by 2030 Power import by using Case 3 T/L (upgrade to 765kV AC) and From Nepal (Purnea -Barapukuria), 1,000 by 2025, Power import by using Case 3 T/L (initially 400kV AC) 3 Bhutan-Bangladesh via-India 1000 MW-Bongaigaon/Rangia -Jamarpur 1,000 by 2030-Power import from Bhutan 4 400 MW by 2020 (100 MW existing) Construction of HVDC (500MW) in Comilla S/S. Some load (100 MW) in Comilla (N) S/S will be disconnected from Indian System 5 1000 MW by 2023 and 1000 MW by 2025 (Power Import Using Case 2 T/L (± 800kV HVDC) 6 1000 MW by 2030 Bibiyana-Meghalaya (PSP) 7 At the Proposal Stage , detailed planning to be done.



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South Asia Energy/Power Sector: Investment Requirements

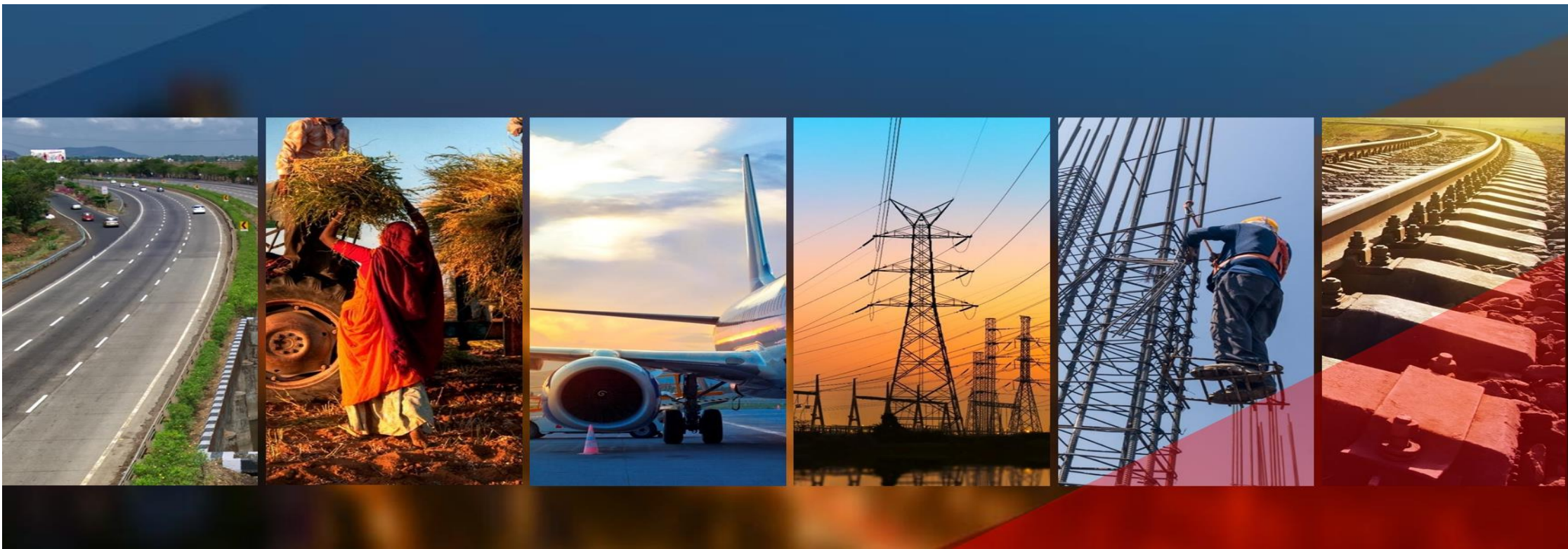




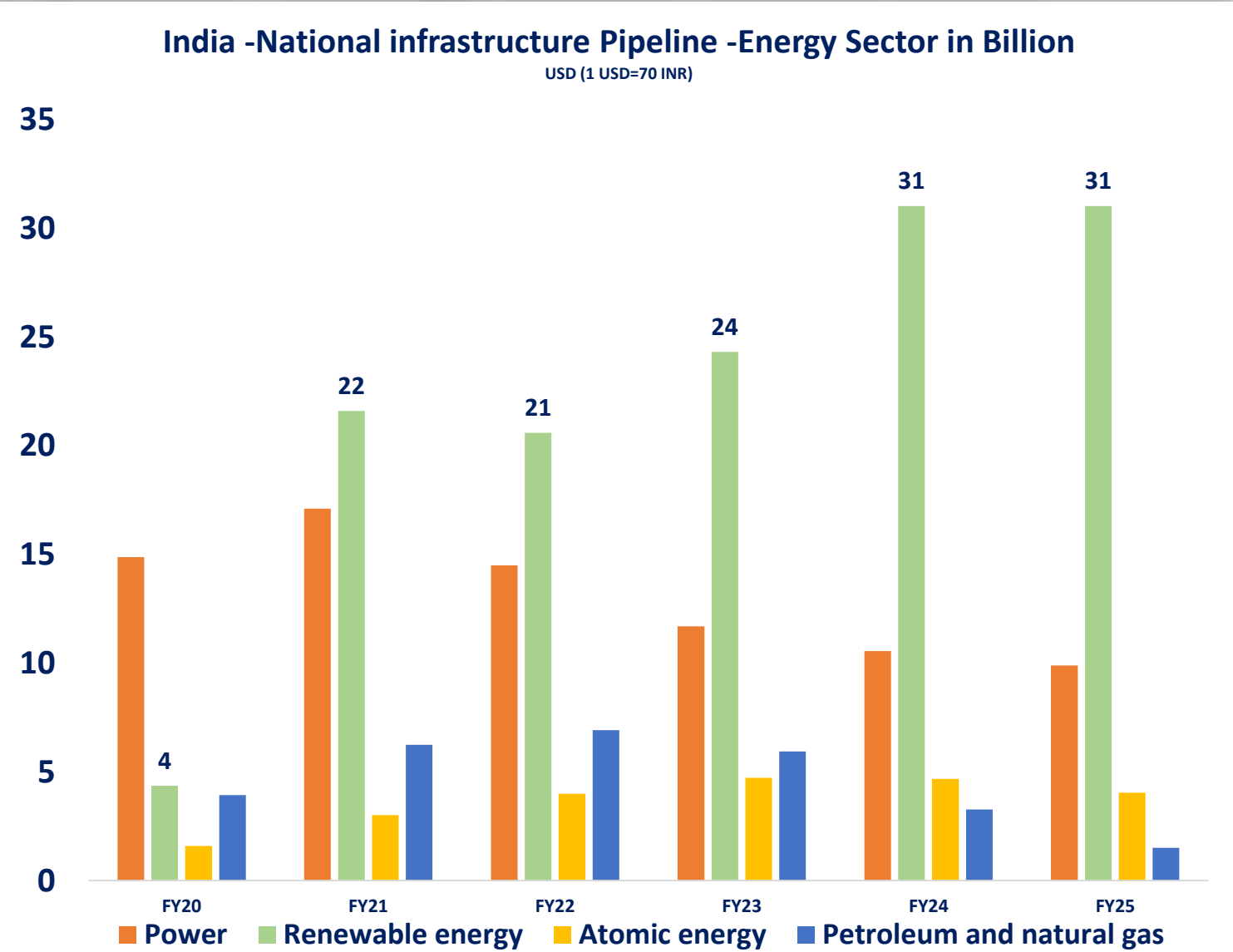
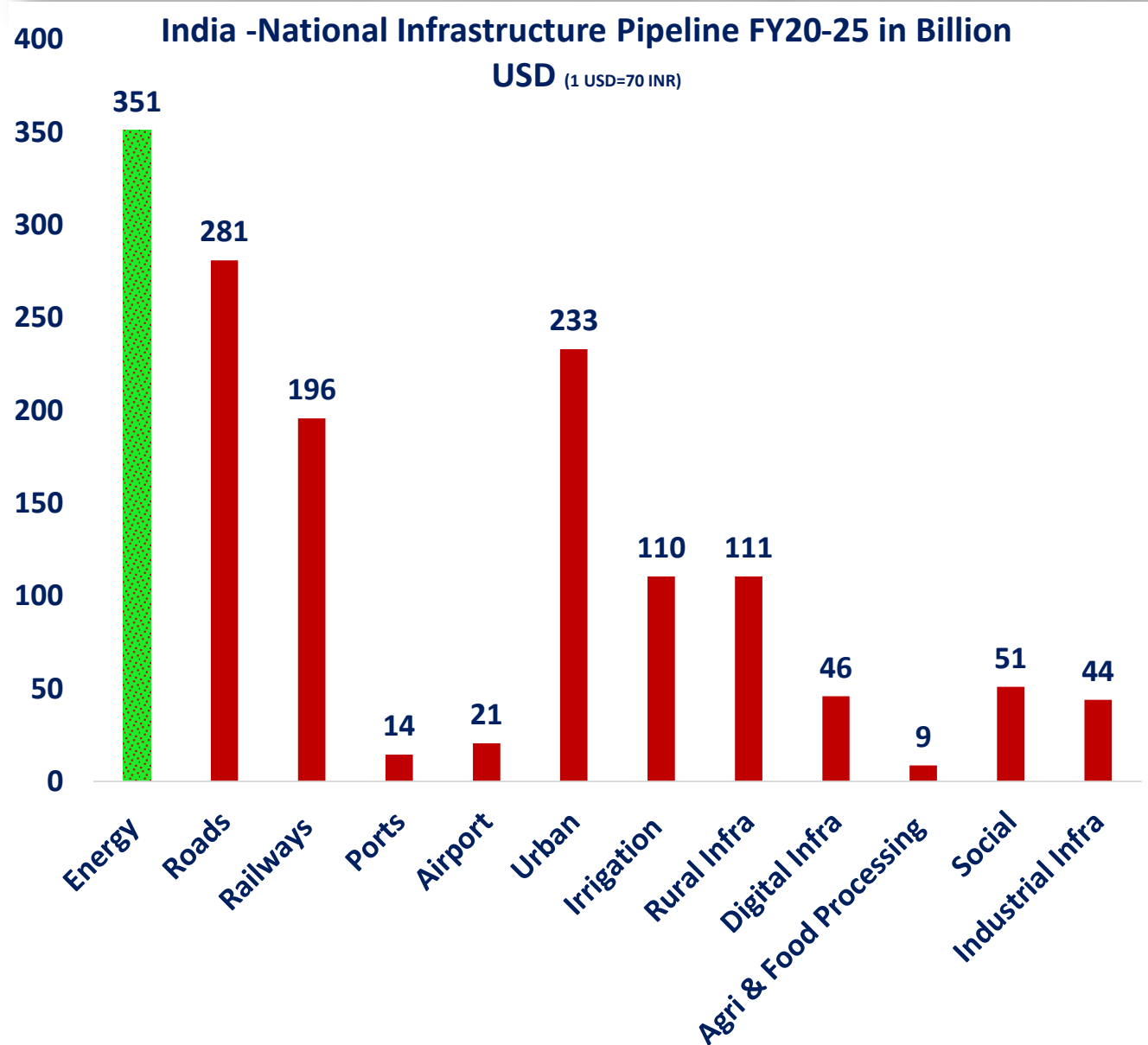
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India : National Infrastructure Pipeline, Released on Dec,2019 India to Invest 1.4 Trillion USD (FY20-25)



India : National Infrastructure Pipeline : Energy Sector Vision 2025



South Asian Power Sector- Investment Requirement (2015-2040 Period)

 Projected to require 1,390 billion US\$ for expanding electricity generation (to add 750 GW of generation capacity).

 Already committed and planned inter-grid connection, especially within India would require around 29 billion US\$.

Investment Requirement for the 2015-2040 Period (Billion US\$)

Country	Investment (Generation)	Investment (Interconnection)
Afghanistan	16.36	0.18
Bangladesh	105.12	0.63
Bhutan	32.08	0.54
India	929.67	27.93
Nepal	10.75	0.00
Pakistan	276.96	0.00
Sri Lanka	18.67	0.00
Total	1,390	29

Source: Projection as per the World Bank Report on "How Much Could South Asia Benefit from Regional Electricity Cooperation and Trade?"

South Asia: Future Energy Investment Opportunities



De-carbonising Power Generation



Cleaner and Efficient Public Transport



Renewable Energy



Electric Vehicle & Charging Infrastructure



Natural gas, LNG and Region Gas Grid



Modernising power grid , smart grid, smart utility



Cross Border Hydro Power Projects and Cross Border Power Transmission



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Regional Investment Framework and Guidelines for promoting investment in South Asian Power Sector & in Cross Border Electricity Trade Projects in South Asian Region



Regional Guidelines for investment framework

Opportunities

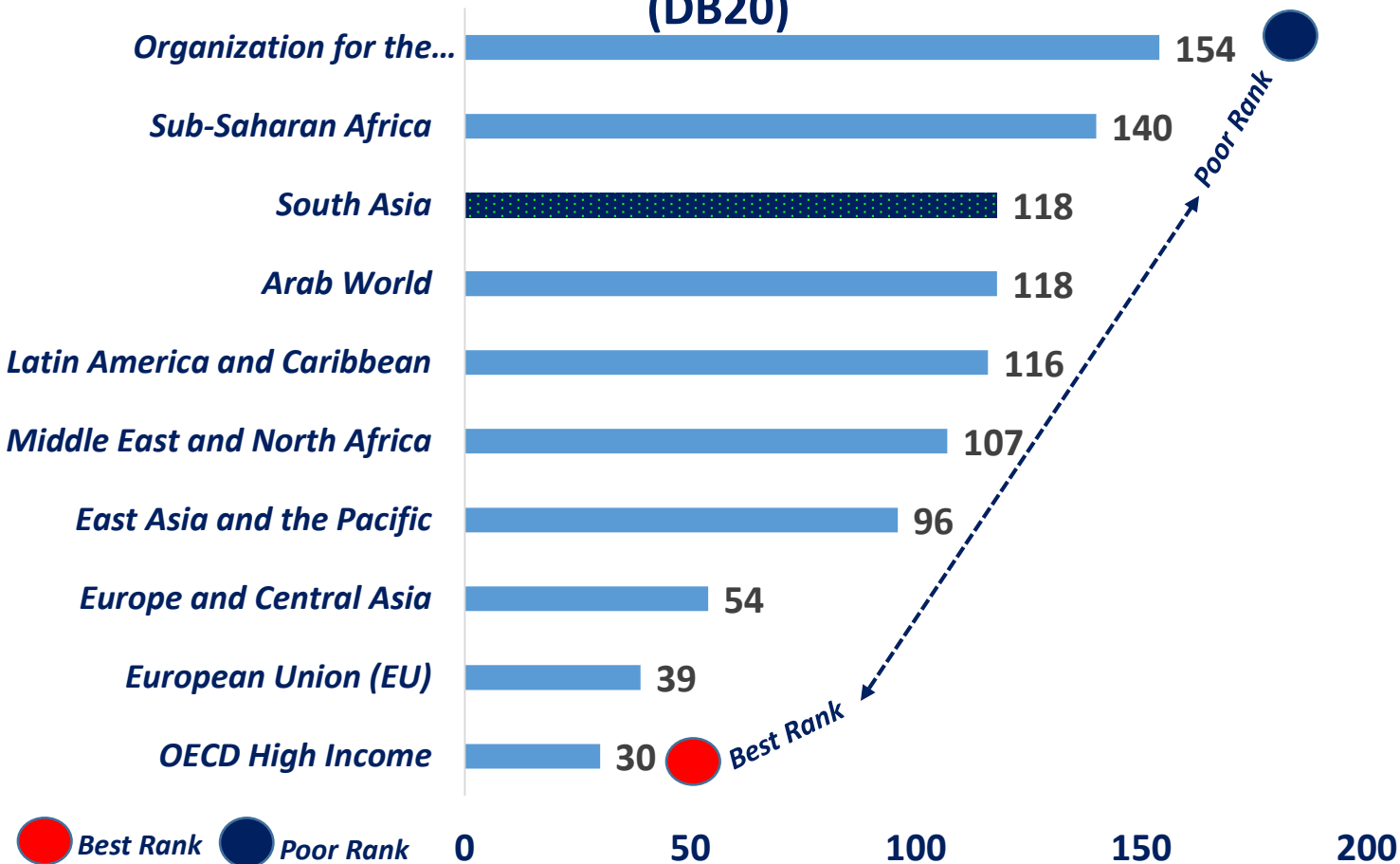
- + Liberal FDI Policies in all South Asian countries
- + Well defined PPP framework for infrastructure in most SA countries like Bangladesh, India and Pakistan
- + Independent electricity regulators in all SA, except Maldives

- Time consuming process for dispute settlement and judicial processes
- Legal and dispute resolution mechanism is not very strong in most countries
- Issues, processes for land acquisition, environmental clearances and rehabilitation, leading to project delays
- Financial Viability of Infrastructure
- Lack of Deep energy markets

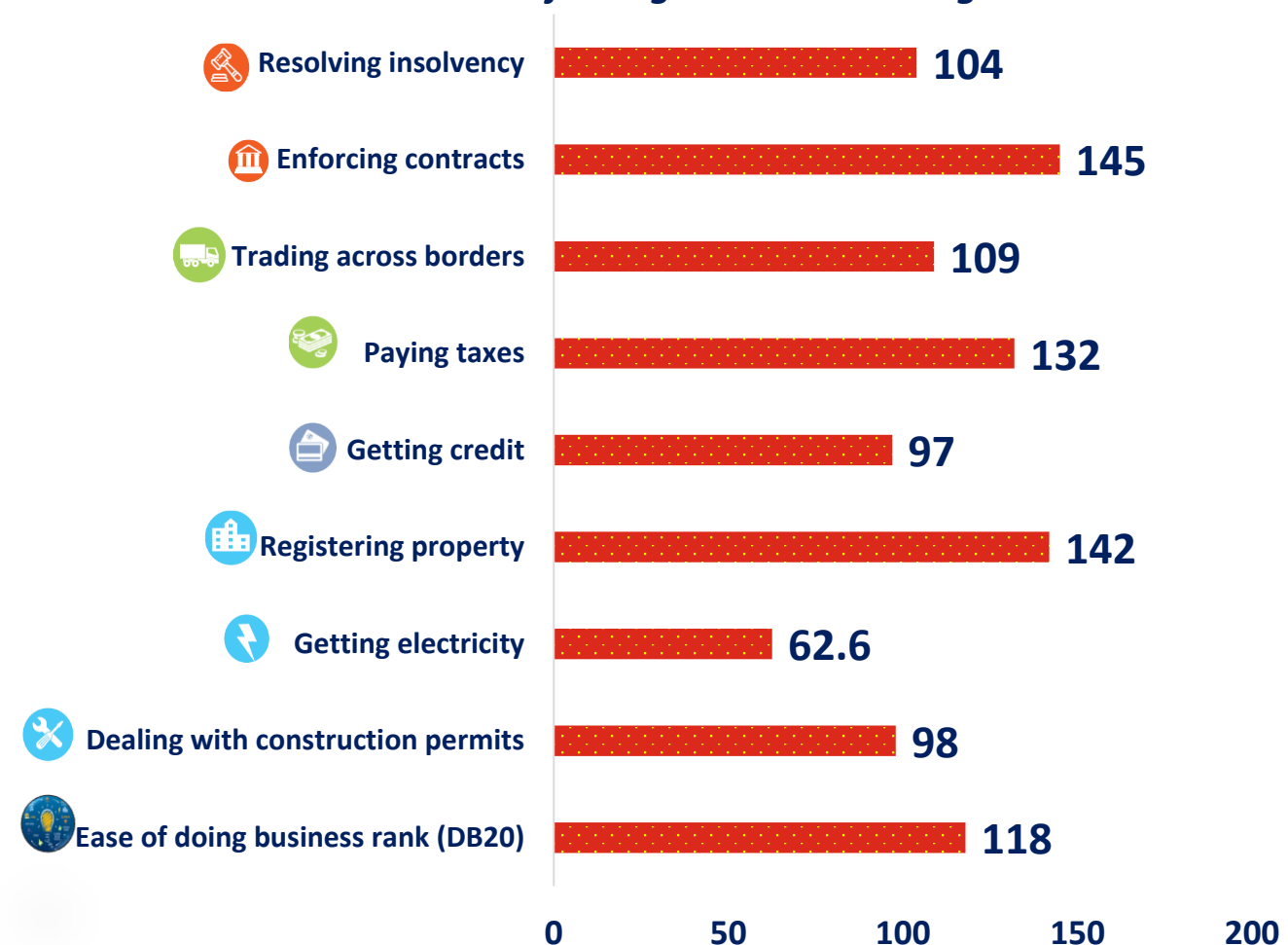
Challenges

South Asia : Ease of Doing Business

Ranks of Subregions : Ease of doing business rank (DB20)



South Asia-Ease of Doing Business Ranking -2020



South Asia & Arab : Ranks (Regional Average) 7th among regions (10) of World

South Asia : India Ranks 63 (Highest), Afghanistan 173 (Lowest)
India, Bhutan (89), Nepal (94) & Sri Lanka (99) are below 100 | Pakistan (108), Maldives(147), Bangladesh (168)

Regional Guidelines for investment framework

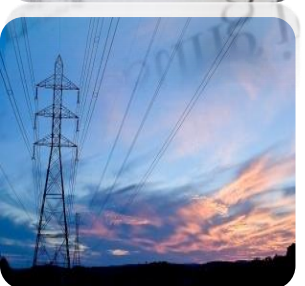
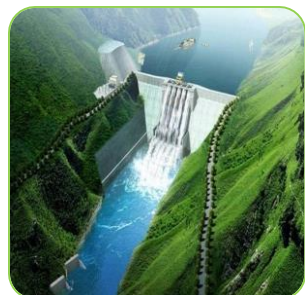


Points for Discussions

- *Focusing on De-risking the Regional Energy Infrastructure Projects : Instruments and modalities.*
- *Strategy for Financing Cross Border Transmission Infrastructure: Business/Financing Models ?*
- *What are the innovative market instruments/ financing mechanisms for financing future energy system ?*
- *Role of Government for fast tracking development ?*
- *Concerns of Lender, private power project developers ?*
- *Role of Private sector, Public private partnerships, Joint Ventures etc. ?*
- *Modernising power grid and decarbonising power sector.*
- *Need of South Asia Regional Investment Facilitation Forum ?*
- *How to accelerate the development of hydro power and mobilisation of investment?*



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Thank You

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Investment Guidelines

1

Policy and Regulatory harmonization

- Establish a Regional Regulatory body, Regional Electricity Regulatory Association to promote regional regulatory cooperation. This body will merely be an association of national regulatory institutions with no powers to intervene in regulatory matters in the region

2

Guarantees against Political and country risks

- Member countries to have guidelines for mitigating political risks such as nationalization, expropriation etc. for domestic and CBET power projects
- Regional guidelines for leveraging available Instruments for political risks like MIGA

3

Regional dispute resolution and settlement mechanism

- Develop guidelines for CBET projects for resolving disputes
- Evolve regional consensus on conflict management and dispute resolution framework amongst member countries - Dispute resolution procedures, alternate Dispute resolution practices, arbitration in neutral third-country, Inter - Government's agreements

4

Streamline project approval and clearance process

- Prepare inventory of processes to be followed in member countries for CBET project approvals, etc
- Member countries' government to provide single window clearance for necessary approvals and licenses
- Issues related to land, environment and R&R to be dealt with on priority basis

Investment Guidelines

5

Standardize contractual framework for CBET

- Standardized contractual documents (PPAs, TSAs, etc) based on commonly agreed regulatory guidelines for the region
- Evolve consensus on providing appropriate payment security mechanisms for cross border projects
- Member countries to have guidelines for foreign currency denominated PPAs to protect against currency risks, allow back to back currency swaps etc

6

Tariff rationalization for the hydropower projects

- Propose regulatory interventions for rationalization of tariffs for the hydropower projects to make them competitive in cross border transactions
- Long tenure loans with flexibility in repayments needs to be developed for the region

7

Access to innovative and cheaper sources of funding

- Attract concessional financing, low cost financing from MFIs, etc.
- Develop coordination mechanism for the domestic capital markets in the South Asian countries to promote liquidity and easy access to equity by private players
- Increased role of multi-lateral funding agencies in CBET projects

8

Develop region specific financing instruments

- Allows broad mass of institutional investors to gain access to green growth projects
- Establish a South Asian Regional Market Fund to offers long and medium term loans with fixed or variable rates to projects in the region
- Green Bonds to raise capital specifically for climate change and green growth related projects. Allow such bonds to be issued as structured notes mechanisms or other underlying derivatives

Investment Guidelines

9

Support private participation through innovative models

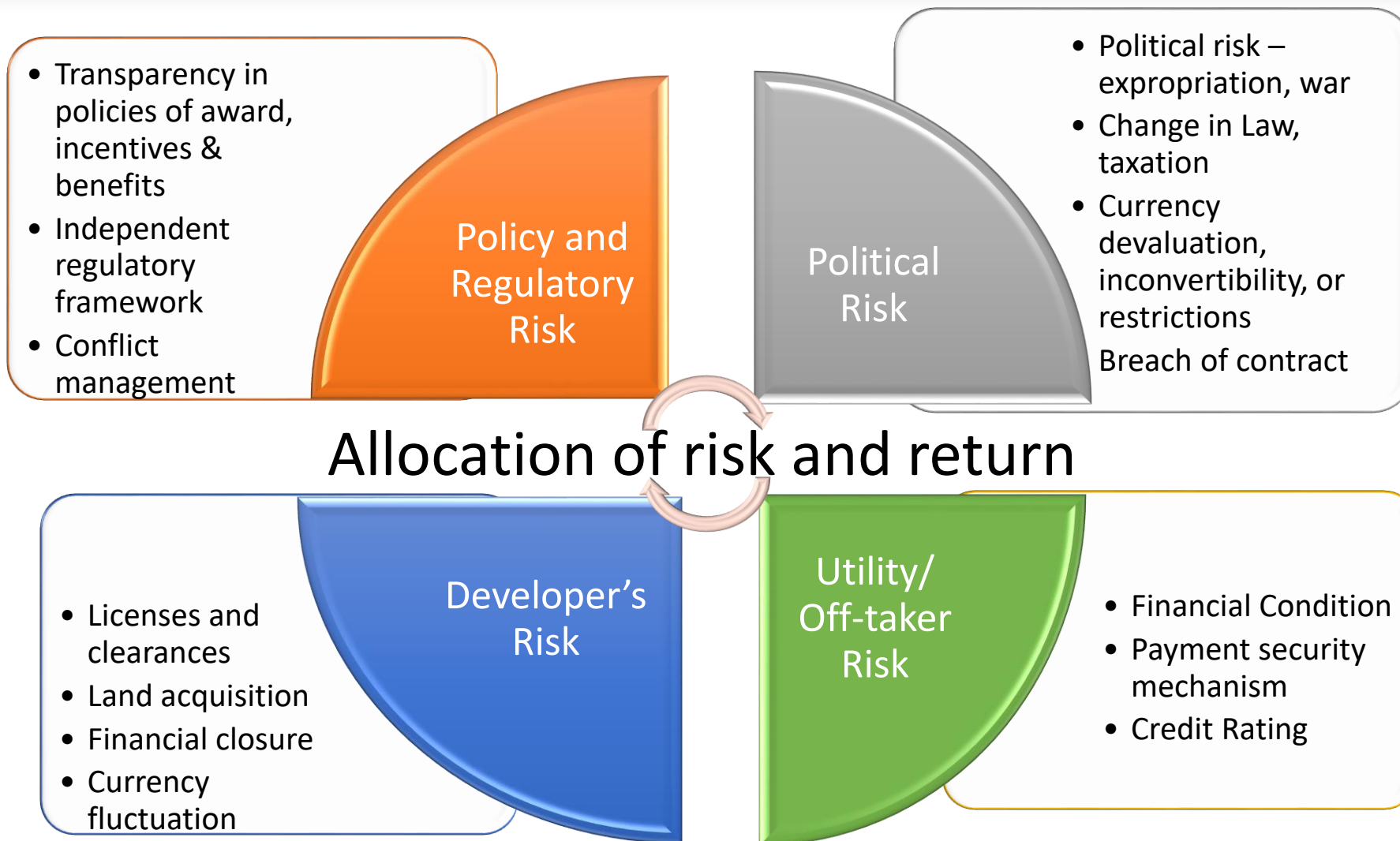
- Establish a clear, predictable and legitimate institutional framework supported by competent and well-resourced authorities
- Use the budgetary process transparently to minimize fiscal risks and ensure the integrity of the procurement process
- Ground the selection of Public-Private Partnerships in Value for Money

10

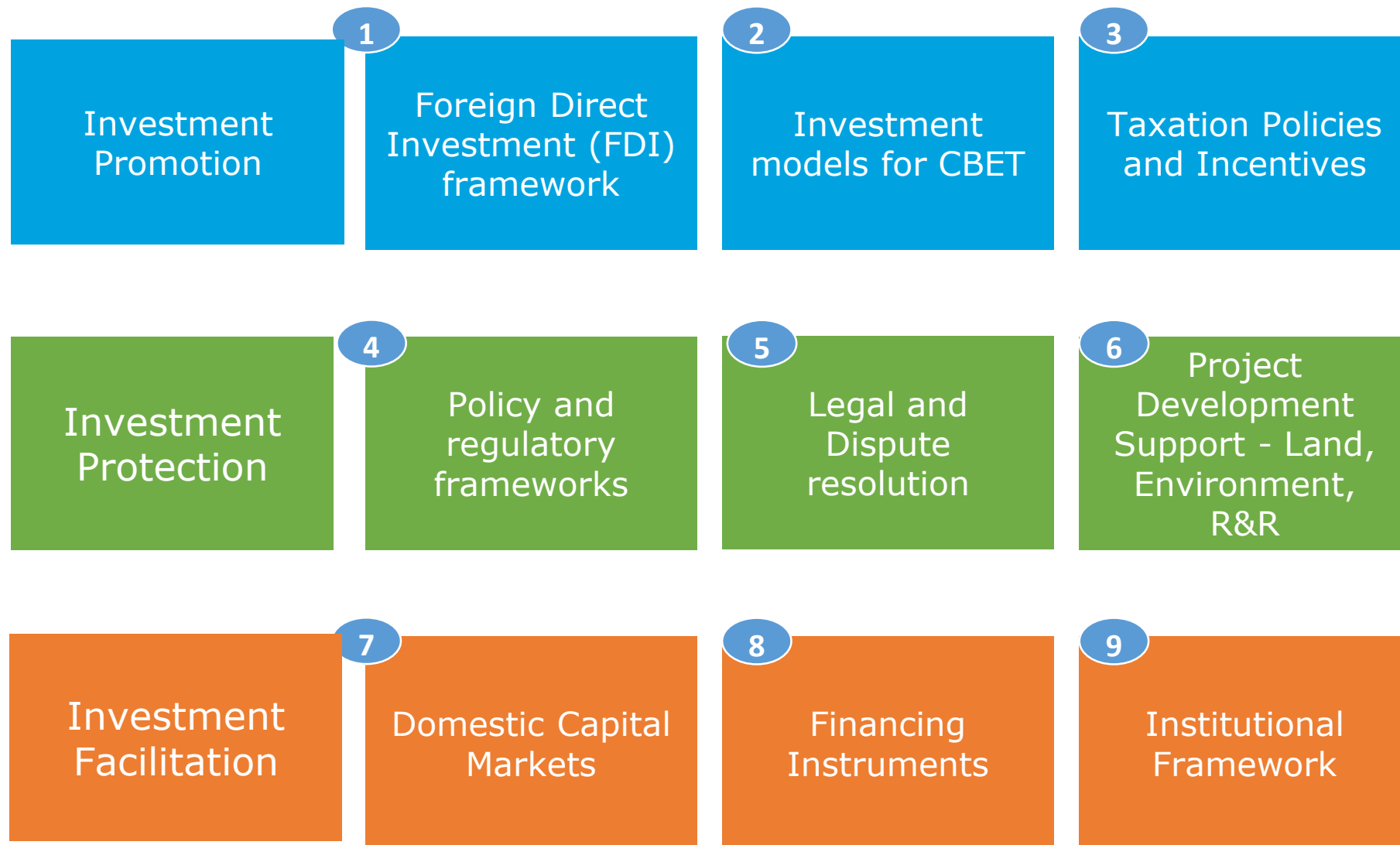
Regional institutional coordination mechanism

- Setting up of coordinating mechanism for the investment promotion in the region under existing SA institutions
- Develop and Implement guidelines for investments, project identification and prioritization, coordinating investments in CBET

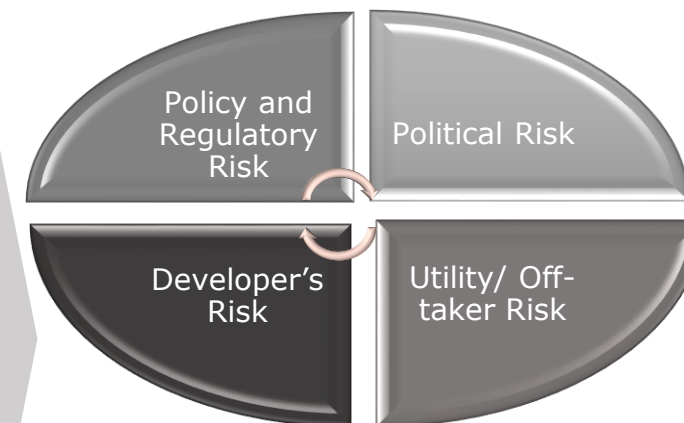
Project Risk assessment matrix



Evaluation framework to mobilize investments



Risk Evaluation Matrix



Regional investment framework for CBET is still evolving

Investment Promotion

Foreign Direct Investment (FDI) framework

- FDI Policies are quite liberal across all countries
- Lacks regional framework for CBET

Investment models for CBET

- PPP framework implemented in India, Bangladesh, Bhutan
- Regional investment model yet to evolve for cross border projects

Taxation Policies and Incentives

- Regional initiatives under SAARC framework
- Domestic policies still to be harmonized

Investment Protection

Policy and regulatory frameworks

- Domestic regulatory frameworks at various levels of evolution (Nepal-Min, India-Max)
- Lacks harmonization at regional level

Legal and Dispute resolution

- Bilateral mechanism and contractual arrangements relied upon
- Lacks regional forum for resolving disputes

Project Development Support - Land, Environment, R&R

- Most project implementation delays caused due to local issues
- Regulatory frameworks are not very strong in many countries

Investment Facilitation

Domestic Capital Markets

- Domestic capital markets in most countries except India lack depth for large investments
- ECB comes with stringent conditions

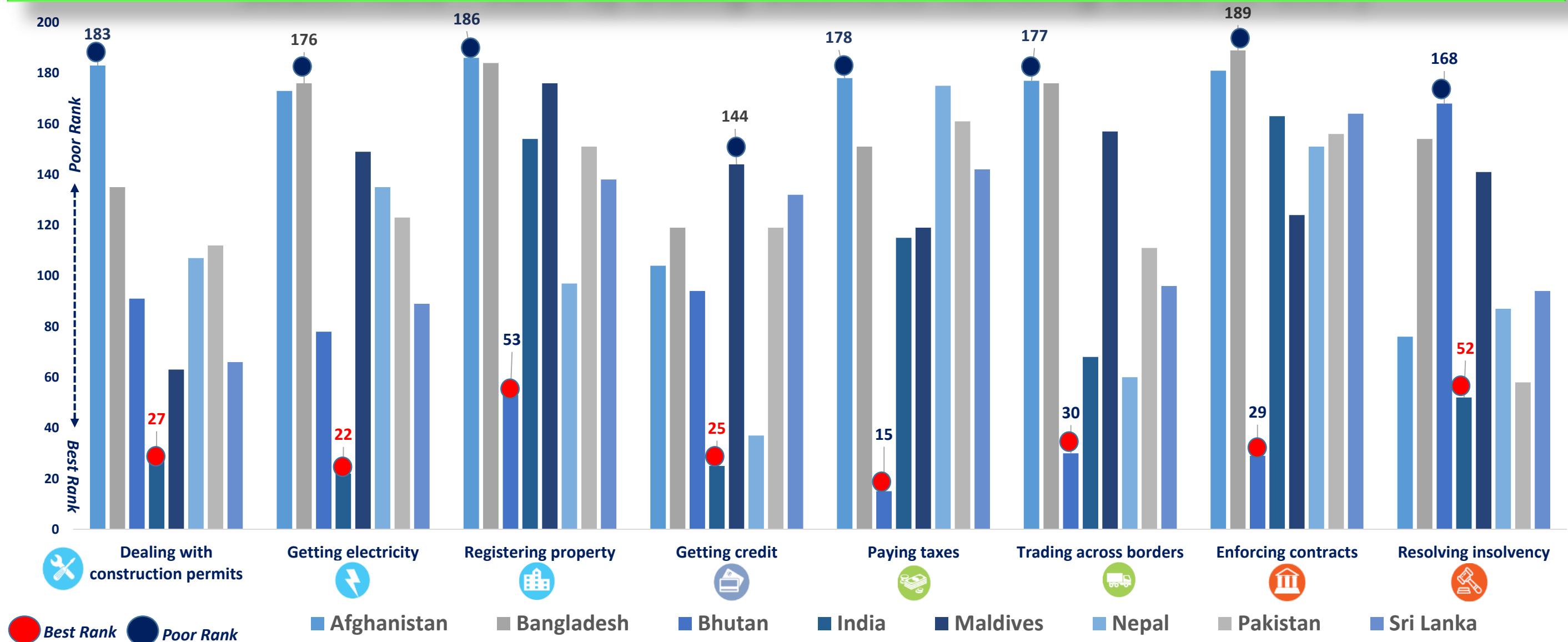
Financing Instruments

- Low cost financing instruments (Green bonds) have not been utilized
- Lacking in innovative debt instruments for cross border hydro projects

Institutional Framework

- Lack of harmonization of technical and commercial frameworks increases risk
- Power trading framework still to be institutionalized in most SAC

South Asia : Ease of Doing Business Ranking 2020 (1-190)



Note/Source -The ease of doing business ranking ranges from 1 to 190. Values are Regional Average Rank- <https://www.doingbusiness.org/en/rankings>

South Asia : Country wise ranks varies among countries

Project Risk Mitigation

• Key Issues and Mitigations

Issues	- Political instability - High transaction cost - Transparency & predictability - Non-discrimination - Change of law - Public governance	- Contract enforcement - Alternate dispute settlement - Administrative process - Legal stability and predictability	- Site identification and resource assessment - Land acquisition, environment, R&R - Off-taker risk - Skilled manpower	- Currency risk (exchange rate, convertibility) - Tax policies - Corporate governance - Liquidity issues, debt financing
	 Political and country	 Policy and Regulatory	 Project Development	 Off-taker
Mitigation	- Political insurances - International investment agreements (BIT, FTA) - BOO, and BOOT business models under PPP - Guarantee against expropriation	- Standardize contract documents - Alternative dispute resolution mechanisms - Regional institution - Capacity building	- Standard technology specific project development guidelines - Single window clearance - Regional skill development center	- Currency hedging (Currency swaps, options, forward contract) - USD denominated PPA - Stable tax regime - Corporate governance