Keeping up with the energy transition: Addressing the skills gap

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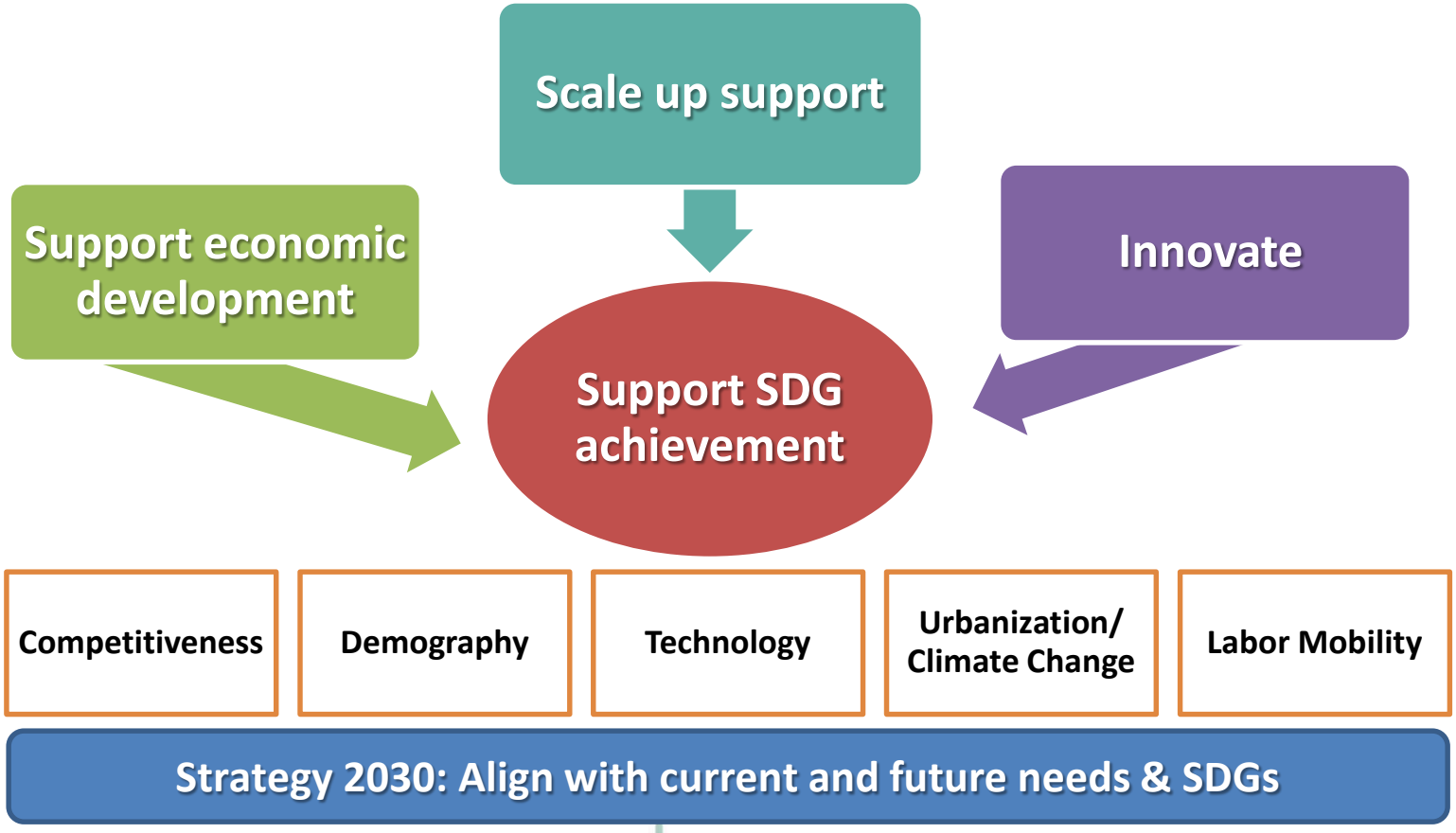
Outline

- Global Convergence and Win-Win for All
- ADB's Education Sector
- Value Chain and Demand-Supply Analysis
- Importance of Skills/Workforce Development
- Strategic and Holistic Response
- Moving Forward

Global Convergence and Win-Win for All

- Criticality of energy access, sufficiency and women empowerment
- Importance of environmental sustainability
- Global commitment
- Opportunity for collaboration

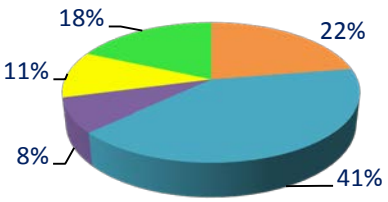
ADB's Education Sector



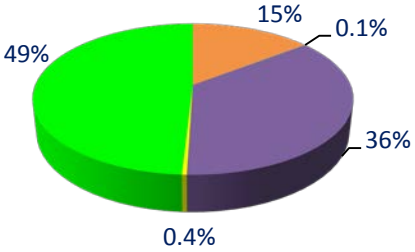
Emerging Response

6-10% Target

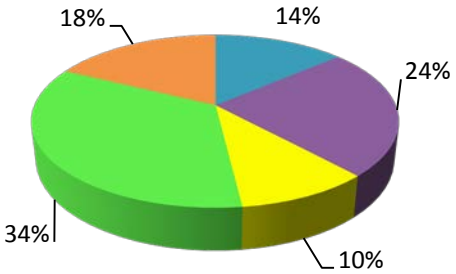
2009-2011
(US$1.284 billion)



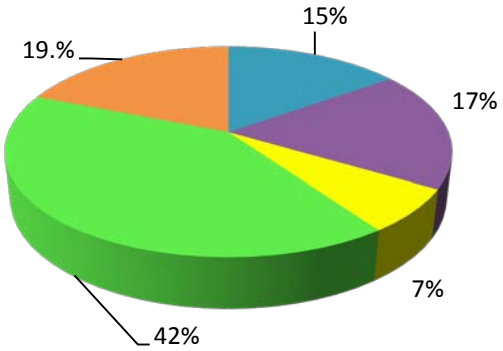
2012-2014
(US$1.760 billion)



2015-2017
(US$3.564 billion)



2016-2018
(US$5.773 billion)



Cross Sector Support

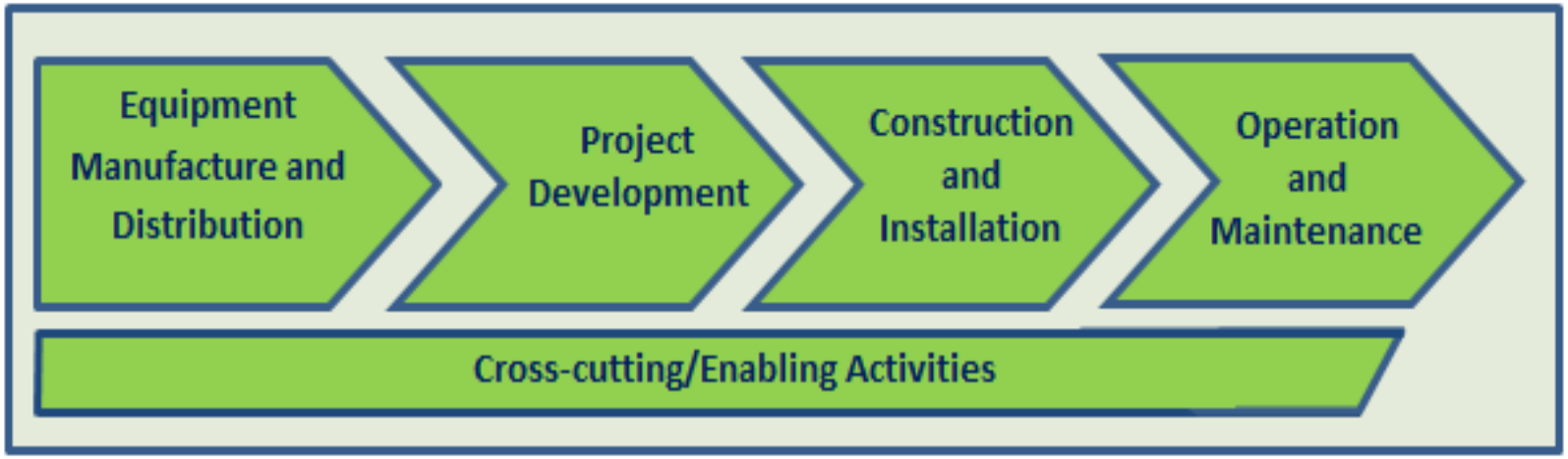
- Elderly care
- Sci/tech, R&D, STEM
- ICT/IT Parks/ Economic Corridors
- Smart Cities/Urban Development
- Growth sectors

Disaster Management & Climate Change

- Armenia, Nepal, Vanuatu
- Clean Energy for education (BAN, PAC, PAK, TAJ)

Value Chain Analysis of Renewable Energy Sector

(wind, solar, geothermal, hydropower, and bioenergy)



- Employment largest during site preparation, installation and commissioning of the facility; comparatively less during operation and maintenance
- Bioenergy: additional value chain to grow and harvest biomass (more people needed in growing, processing and transporting biomass)
- Cross-cutting/enabling: educators and trainers, human resource specialists, and health and safety consultants

Reference: ILO 2011. Skills and Occupational Needs in Renewable Energy. Geneva.

Demand-Supply Analysis: Energy Needs and Gender Dimension

Demand	Supply
Household consumption	Public utility companies
Public and private enterprises	Private utility companies
Others (services)	Household investments
Technological changes/innovations	

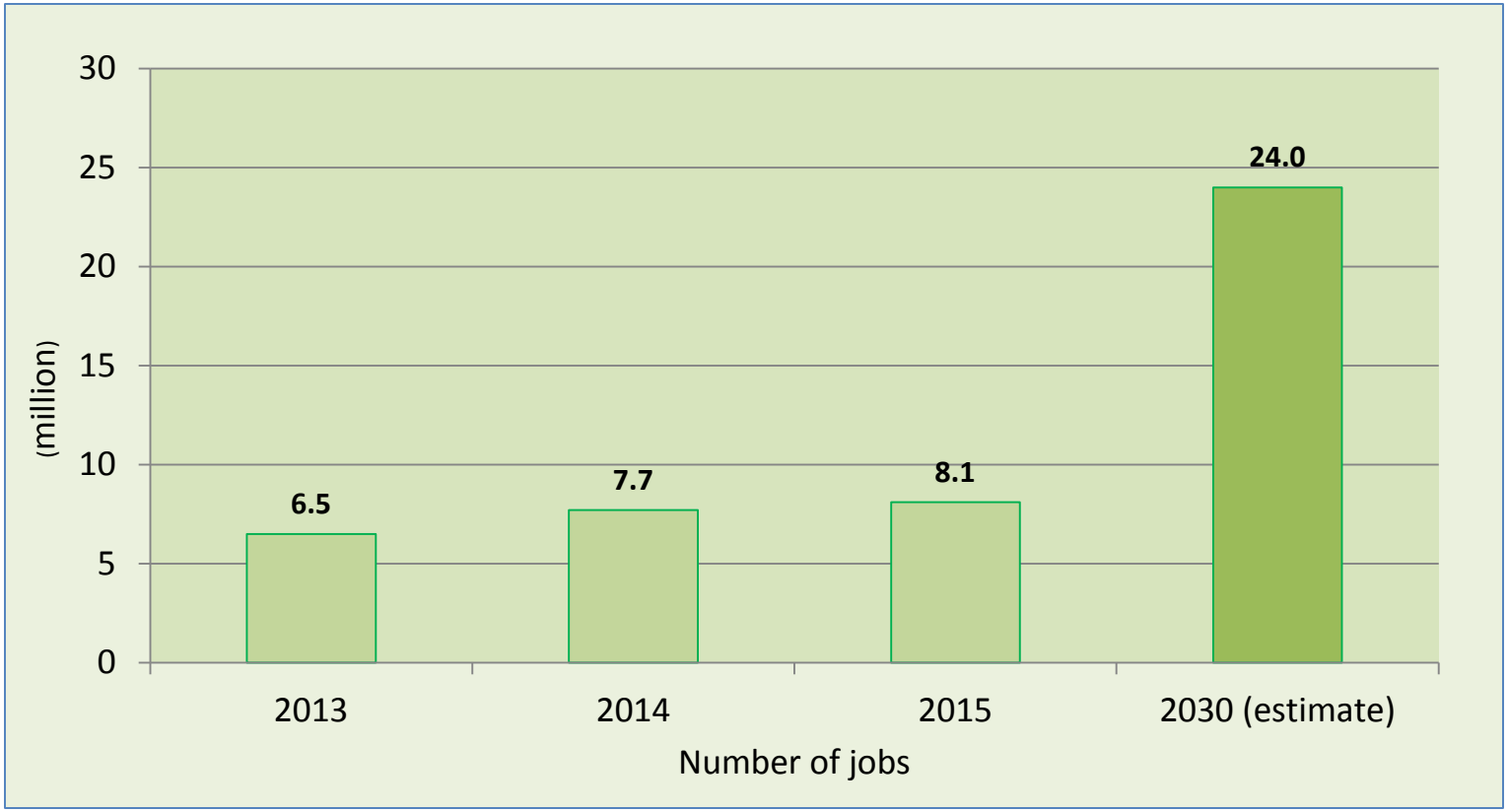
Effective demand is a function of

(i) demand: quality, cost/affordability, efficiency

(ii) supply: financial, human resources

(iii) incentive structures (carbon pricing, subsidies)

Demand-Supply Analysis: Jobs



Sources: IRENA (various years). Renewable Energy and Jobs Annual Review.

Demand-Supply Analysis: Skill-Gap Analysis Occupations

- Professional, Managerial (High-skilled)
  - Examples: manufacturing engineers; project design engineers; civil, mechanical and electrical engineers; project managers; plant managers; agriculture scientists; educators and trainers
- Technician, Skilled crafts, Supervisory (Medium-skilled)
  - Examples: manufacturing technician; procurement personnel; skilled construction workers (such as heavy machine operators, welders, pipe fitters); electricians
- Semi-skilled and unskilled (Low-skilled)
  - Examples: equipment transporters; construction laborers; agricultural/forestry workers

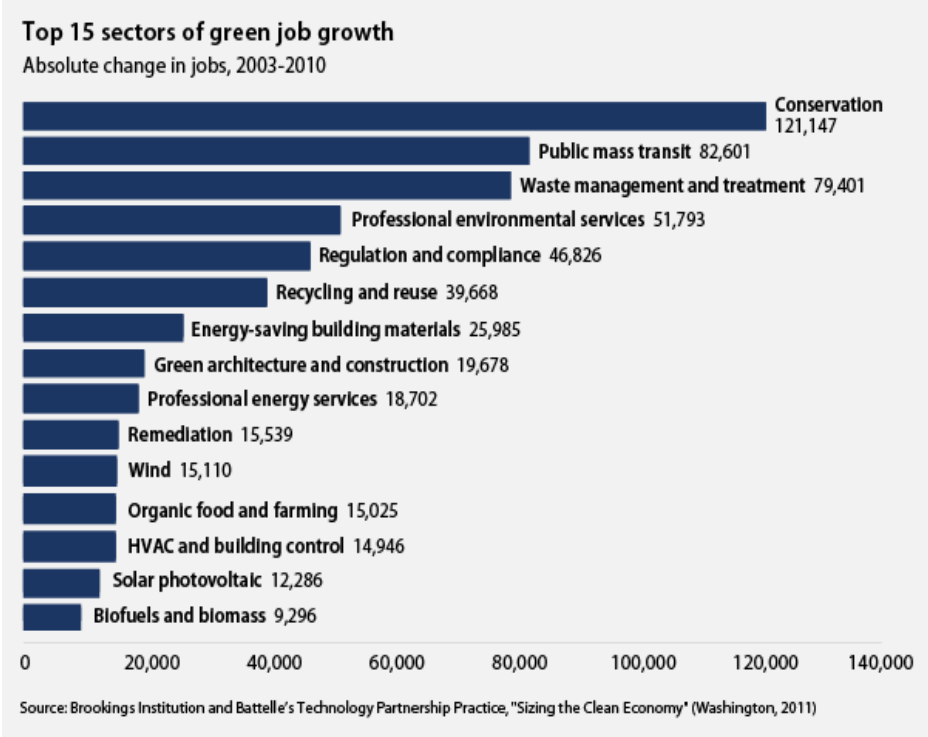
Demand-Supply Analysis: Skill-Gap Analysis
Difficult Occupations

Wind Energy	Solar Energy	Hydropower	Geothermal	Bioenergy
• Project developers • Service technicians • Data analysts • Engineers – electrical, computer, mechanical, construction	• Installers and maintainers - photovoltaic and solar thermal system • Building inspectors	• Engineers – electrical and operations and maintenance • Technicians • Tradespersons • Sustainability specialists	• Engineers – geothermal • Trainers	• Engineers - R&D and design • Service technician • Trainers

Source: IRENA 2014. Renewable Energy and Jobs, Annual Review 2014.

Green Jobs

- Jobs in renewable energy as part of "green jobs"
- Other green jobs
  - Sustainable transport
  - Green buildings
  - Recycling
  - Waste management
  - Agriculture
  - Tourism
  - Education and health



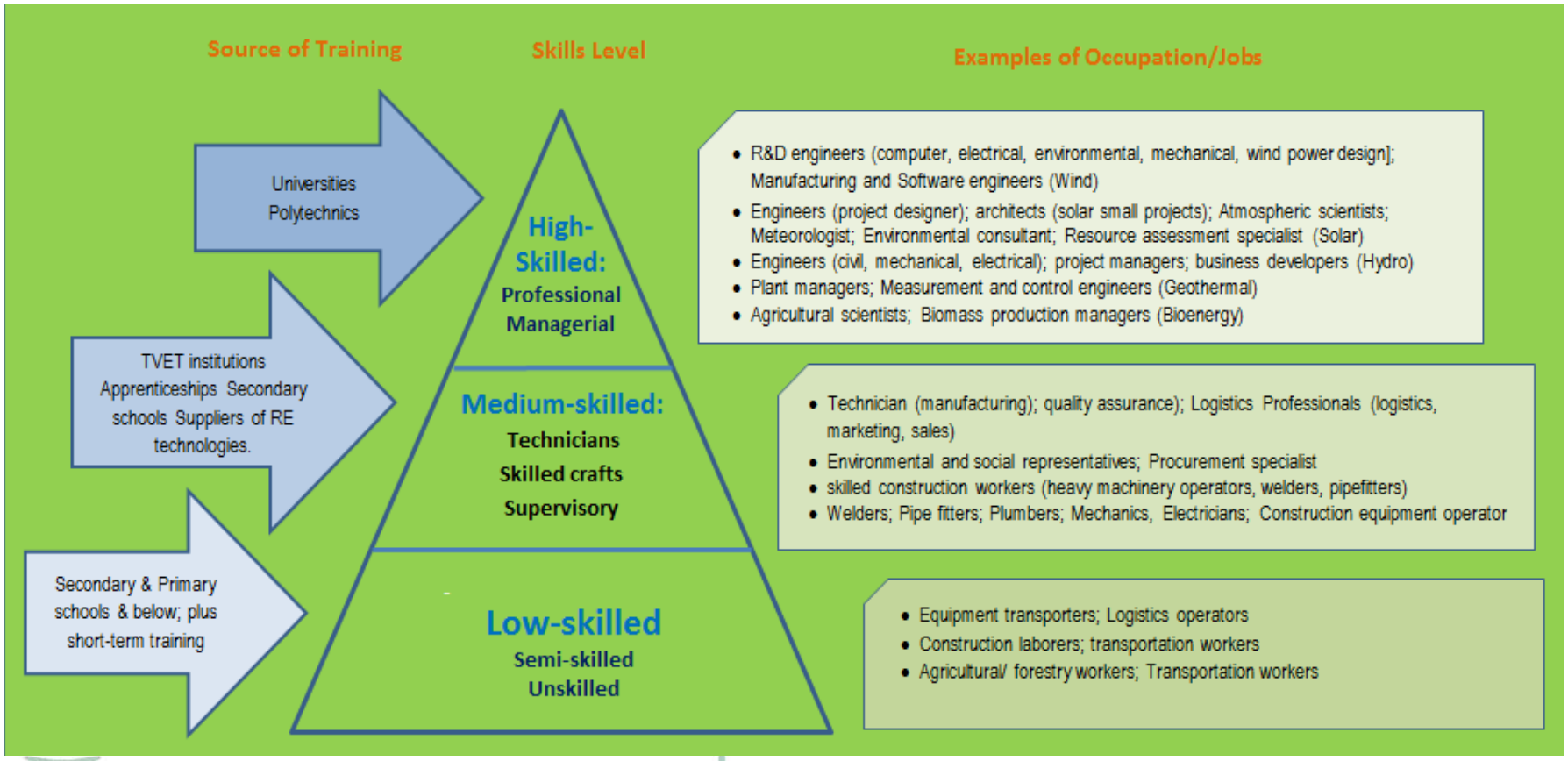
Importance of Skills Development

- What does research and experience tell us?
  - Employment in RE is projected to increase from 8.1m in 2015 to over 24m or three times by 2030
  - Many institutions are emerging
  - There is ad hoc ism (e.g. project based training, fragmented ecosystem)
  - Some occupations are difficult to fill
  - Uniformity in standards, training, assessment, and certification
  - Capacity in training, employer engagement and synergy across institutions/value chain
  - Special efforts (e.g. STEM, girls education, targeting)
  - R&D and technology adaptation

Importance of Skills Development: Key Principles

- Adoption of qualifications framework / mutual recognition
- Rigorous quality assurance mechanism (curriculum, standards, quality of trainers and assessors, assessment and certification)
- Synergy across education sector (STEM, school, TVET and higher education)
- Governance, policy and regulatory framework, M&E and compliance
- Ensuring inclusivity

Strategic and Holistic Response: Skills Development



Examples of Centers

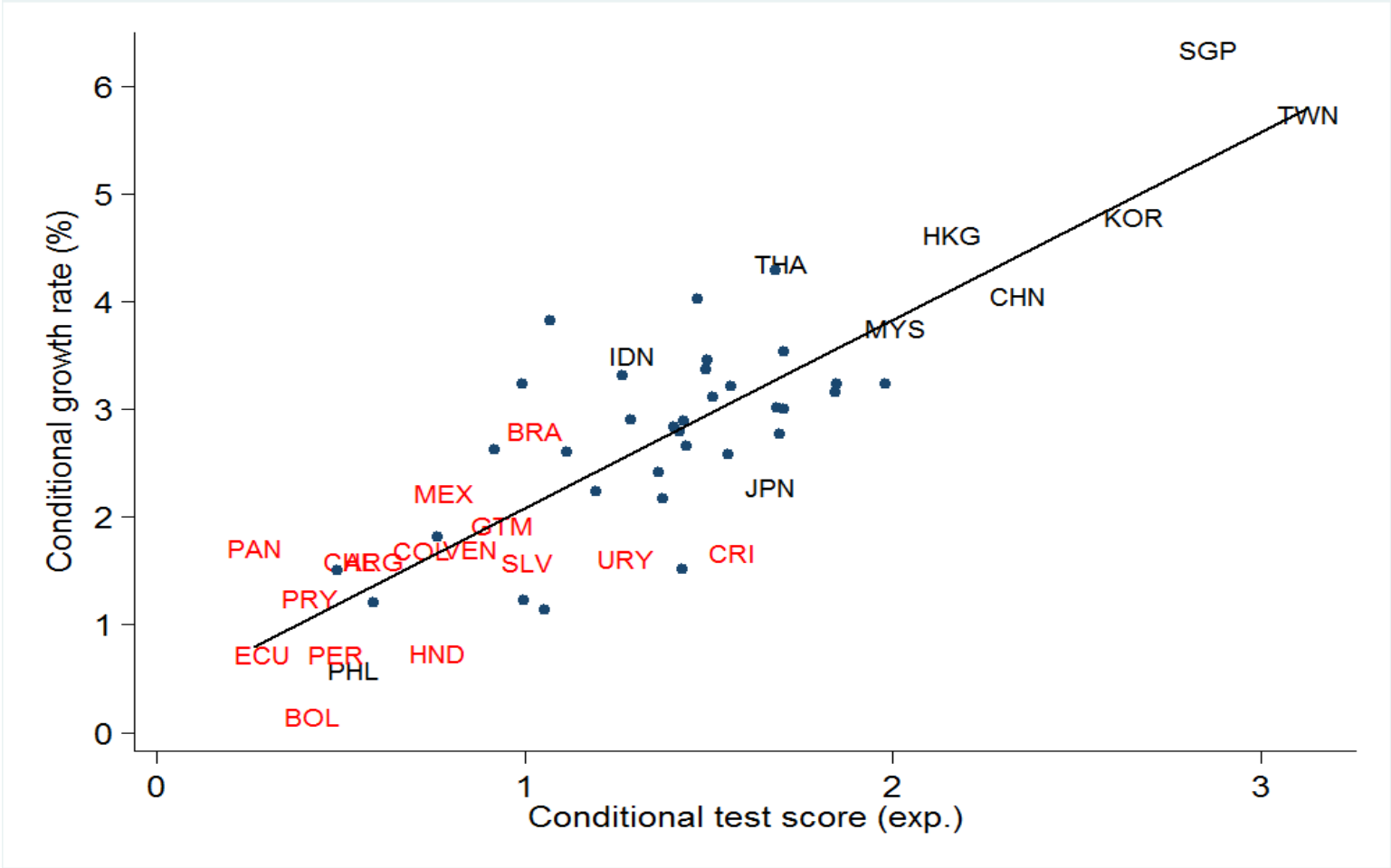
- ILO International Training Center, Turin, Italy
- Utility companies (e.g. Chevron in Indonesia/Qatar, PRC and other countries)
- Universities (R&D centers, different types of training)
- International Energy Agency
- World Resource Institute
- International Renewable Energy Agency (IRENA)
- Renewables Academy (RENAC)
- Others in NA, Europe, and other countries like Australia, Korea, Japan, Singapore, etc.

Centers of Excellence

- Demonstrate and lead high quality training
- R&D
- Network and partnerships with national & global institutions
- Standards, curricula, methodology
- Assessment and certification
- Capacity building
- Skill-gap analysis
- M&E
- Different models (governance)

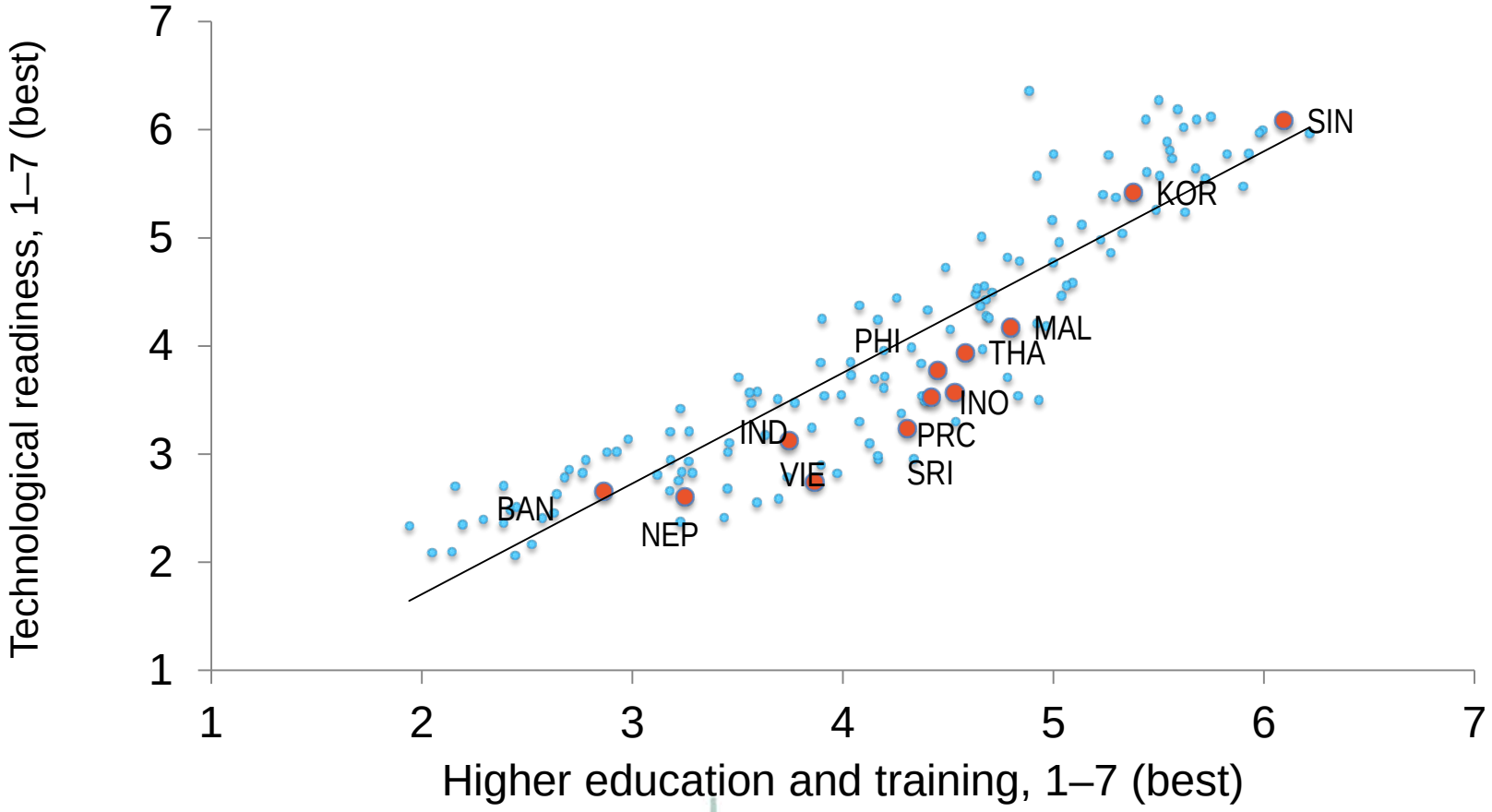
Source: UNIDO-China Energy Partnership,

Human Capital and Economic Development



Source: Hanushek and Woessmann (2008)

Higher Education and Technological Readiness



Scores are normalized into a 1-to-7 scale.
BAN = Bangladesh; IND = India; INO = Indonesia; KOR = Korea, Rep of; MAL = Malaysia, NEP = Nepal; PHI = Philippines; PRC = People's Rep. of China; SIN = Singapore; SRI = Sri Lanka; THA = Thailand; VIE = Vietnam.
Source: Schwab and Sala-i-Martín (2014).

Future of Jobs

WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD

Top 10 skills

in 2020	in 2015
1. Complex Problem Solving	1. Complex Problem Solving
2. Critical Thinking	2. Coordinating with Others
3. Creativity	3. People Management
4. People Management	4. Critical Thinking
5. Coordinating with Others	5. Negotiation
6. Emotional Intelligence	6. Quality Control
7. Judgment and Decision Making	7. Service Orientation
8. Service Orientation	8. Judgment and Decision Making
9. Negotiation	9. Active Listening
10. Cognitive Flexibility	10. Creativity

Source: Future of Jobs Report, World Economic Forum

Boosting STEM Education

- STEM to support inclusive and sustainable development
- What can we learn from global good practices?
- SDG 4
- International benchmarking: PISA, TIMSS, PIAAC
- Mainstreaming ICT: targeting girls and disadvantaged groups

Way Forward

- Improve quality of education
- Target girls/females and disadvantaged: schools, TVET, higher education, leadership and jobs
- Establish strategic partnerships - STEM, Training, R&D
- Promote innovations and technologies
- Improve governance of green transition
- Mobilize and prioritize resources

Source: Skill Build Training, Australia