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Challenges & Opportunities in Technology Transfer to Developing Countries of South Asia 向南亚发展中国家进行技术转移的挑战和机遇

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Establishment & Objective 成立与目标

- Established in 2006 with an objective to improve energy situation in SAARC countries through regional cooperation
- 成立于2006年，旨在通过区域合作改善南盟国家的能源状况。

Range of Activities 活动范围

- Research studies, capacity building, knowledge/info/data sharing, trainings, webinars, technology demonstration
- 研究，能力建设，知识/信息/数据共享，培训，网络研讨会，技术演示。

Funding & Networking 资金和网络

- Supervision and funding by member states; through Governing Board
- 成员国通过理事会进行监督和资助；
- Strong linkages with UNESCAP, WB, ADB, USAID, IRENA, Germany, Japan, Europe, and others
- 与亚太经社会、世行、亚行、美国国际开发署、国际可再生能源机构及德国、日本、欧洲等国有着密切联系
Looking forward for linkages with Chinese & ASEAN institutions期待与中国和东盟机构建立联系
- China is an observer to SAARC. 中国是南盟的观察员。

Presentation Outline 纲要



- Introduction 介绍
- ToT and South Asia 技术转移与南亚
- Challenges & hurdles for ToT 技术转移面临的挑战和障碍
- Opportunities for ToT 技术转移的机遇
- Recommendations 建议
- How organizations like SEC can contribute
- 南盟能源中心等相关组织如何做出贡献

Why ToT to Developing Countries

为什么要向发展中国家进行技术转移

- Is beneficial to both source and recipient country 来源国和受援国均可受益
 - » Source (developed country) 来源 (发达国家) :
 - » Additional markets, Higher profits, Low cost production, etc.
 - » 额外的市场, 更高的利润, 低成本的生产等
 - » Recipient (developing county): 受援国 (发展中国家)
 - » Access to advanced knowledge/technology/product; Savings in time, cost & resources; Import substitution; Increased technology & industrial base; Increase in national human, S&T, material & financial resources; etc.
 - » 获得先进的知识/技术/产品; 节省时间、成本和资源; 进口替代; 拓展技术和工业基础; 增加国家人力、科技、物质和财政资源等
- It also helps both countries in following: 同时有助于双方:
 - » Sharing of cost of technology development
 - » Reduction in economic disparity
 - » Increases regional contribution to global economy
 - » Increase in spirit of goodwill and promotes harmony
 - » 分担技术开发成本
 - » 减少经济差距
 - » 增加区域对全球经济的贡献

South Asian Requirement for ToT

南亚对技术转移的需求

- All 08 are developing countries; with strong political will for development, but are hindered by energy shortage, poor energy access, lack of infrastructure, etc.
- 南盟八个成员国都是发展中国家；具有强烈的政治发展意愿，但受能源短缺、能源供应不足、基础设施缺乏等因素的制约。
 - » Considerable emphasis on renewable, efficient & alternative energy technologies and environment etc.
 - » Leadership conscious about self-reliance, indigenization, exports capability and similar.
 - » 注重可再生资源以及高效和替代能源技术和环境等。
 - » 领导层重视推进本国的自力更生、本土化发展、出口能力等。
- Good chance for China and others to capture market
- 对中国等国来说是抓住市场的好机会
 - » But, generally the success rate for ToT in South Asian countries had been low.
 - » 然而，一般来说，南亚国家技术转移的成功率一直很低。
 - Many reasons on both sides. Including imbalanced benefits to both, conflicting objectives, difference in political system, government structure, culture, language, economic environment
 - 双方都各有原因，包括双方利益不平衡、目标冲突、政治制度的差异、政府结构、文化、语言、经济环境等

Challenges & Hurdles to ToT

技术转移面临的挑战和障碍

- Ministries/offices lack expertise and financial resources; have old mind set, obsolete procedures; un-supportive policies, disjointed and uncoordinated efforts, inefficient institutions, less organized private sector, etc. etc.
- High cost of doing business, corrupt practices, instable political system, political revelries, weak judicial system,
- Low expertise for supporting services (QA, Reliability engineering, Configuration Management, etc.)
- Inappropriate selection of technology
- 政府各部门缺乏专业知识和财政资源；思想过时，程序过时；缺乏政策支持，各方工作脱节不协调，机构低效，私营部门欠缺组织等。
- 营商成本高，腐败问题，政治制度不稳，政治对抗，司法系统薄弱，
- 支撑服务专业水平低（质保，可靠性工程，配置管理等）
- 技术选择不当

Case-1 : Wind Turbine Tower Manufacturing

案例1：风力涡轮机塔架制造

ToT of Tower Manufacturing of Wind Turbines 风力涡轮机塔架制造技术转移

Company公司	Three Gorges Wind Farms Pakistan三峡巴基斯坦风电场
Location地点	Jhampir, Sind Province 信德省，贾姆皮尔地区
Owner/Source ToT 技术来源国	Three Gorges China中国三峡集团
Operations period 运营期	2014 - 2017
Size of orders executed 已执行订单规模	Towers for turbines (~ 250 MW) 涡轮机塔架（约250兆瓦）
Present status现状	Factory is completely closed工厂已全面关闭
Reason for closure 关闭原因	No manufacturing orders as no wind projects are being developed in Jhampir 由于贾姆皮尔地区没有开发风能项目，没有生产订单



Case-2 : Micro Hydro Turbine Manufacturing

ToT through Int'l Agency for Micro Hydro Turbines

Int'l Agency	GIZ	
Location	Mardan, KpK Provin	
Company	Mukhtiar Engineeri Pakistan	
ToT Year	2009	
Total turbines produced after ToT	160+ turbines	
Status before ToT	Manufactured turbines were small and less efficiency	
Present status	Running successfully and happy	

ToT Opportunities In South Asian Countries

南亚国家的技术转移机遇

- Market of over 1.72 billion people. In need of energy technologies, including RE, EE, LCT & similar.
 - » At all levels, all scales and across.
 - » Small scale RE technologies have favorable ToT conditions
 - Solar panels, Invertors, Battery (lithium ion), System design services
 - Electrical vehicles & charging infrastructure
 - Energy efficient, smart appliances/gadgets, LED bulbs, SWH, Inverter AC
 - Plantation, Forestation & Green buildings technologies
 - Municipal solid waste management / utilization
 - Power infrastructure, Grid modernization, HVDC technology
 - Wind, and Small/medium hydro, Bio-gas, Energy & Infrastructure projects

Top Opportunities In South Asian Countries

南亚国家的技术转移机遇

- 市场规模超过17.2亿人，对可再生能源、能效、低碳技术等能源技术有需求。
 - » 各级别、各规模、跨部门。
 - » 小规模可再生能源技术具备有利技术转移条件
 - 太阳能电池板，逆变器，电池（锂离子），系统设计服务
 - 电动汽车和充电基础设施
 - 节能，智能家电/小工具，LED灯泡，太阳能热水器， AC逆变器
 - 种植园，造林和绿色建筑技术
 - 城市固废管理/利用
 - 电力基础设施，电网现代化，HVDC技术风能，中小型水电，生物燃气，能源和基础设施项目
 - 石油管道铺设
 - 农业生产和节水技术
 - 食品加工技术
 - 工业自动化，采矿，硅矿精炼技术

Recommendations for Successful ToT

实现成功技术转移的建议

- Start ToT with few and non-critical components
 - » Follow easy-to-complex path
 - » Have blended teams
 - Scholarships to young for training / study in China shall help
 - » Include quality control, standardization, certification, etc
 - » Try non-conventional or on-line distribution channels
 - » In special economic zones: incentives & facilities available
 - » ToT be export oriented for recipient country
- Product matrix
 - » Low/medium cost; offer lower costs for big volumes
 - Talk to government for aggregated demand, factory-

Recommendations for Successful ToT

实现成功技术转移的建议

➤ 技术转移从少量非关键组件起步

- » 遵循有易到难的路径
- » 团队多元化
 - 资助青年人才在中国接受培训/学习
- » 纳入质控、标准化、认证等体系
- » 尝试非传统或在线分销渠道
- » 经济特区：提供激励措施和设施支持
- » 技术转移需针对受援国的出口导向

➤ 产品指标体系

- » 低/中等成本；大批量生产下可进一步降低成本
 - 与政府商讨国内总需求和工厂直销
- » 质量稳定，性能中等
 - 提供保修；成本回报选项
- » 提供良好售后支持的支持中心

How Organizations Like SEC Can Contribute

南盟能源中心等相关组织如何做出贡献

- Free access to their knowledge/ expertise/ data base
- Can undertake initial research on concepts/ideas
- Can promote product or services or ideas
- Can show case / demonstrate for small products
- Offer its linkages in all South Asian countries
 - » All stakeholders; industry, NGOs, Government, academia, users, etc.
- Can recommend technologies / products in advisory capacity
- 免费提供其知识/专业知识/数据库
- 对概念/创意进行初步研究
- 推广产品、服务或想法
- 展示小型产品的案例/演示
- 提供其在所有南亚国家的联系网络
 - » 所有利益相关者：行业，非政府组织，政府，学术界，用户等
- 可推荐咨询能力范围内的技术/产品

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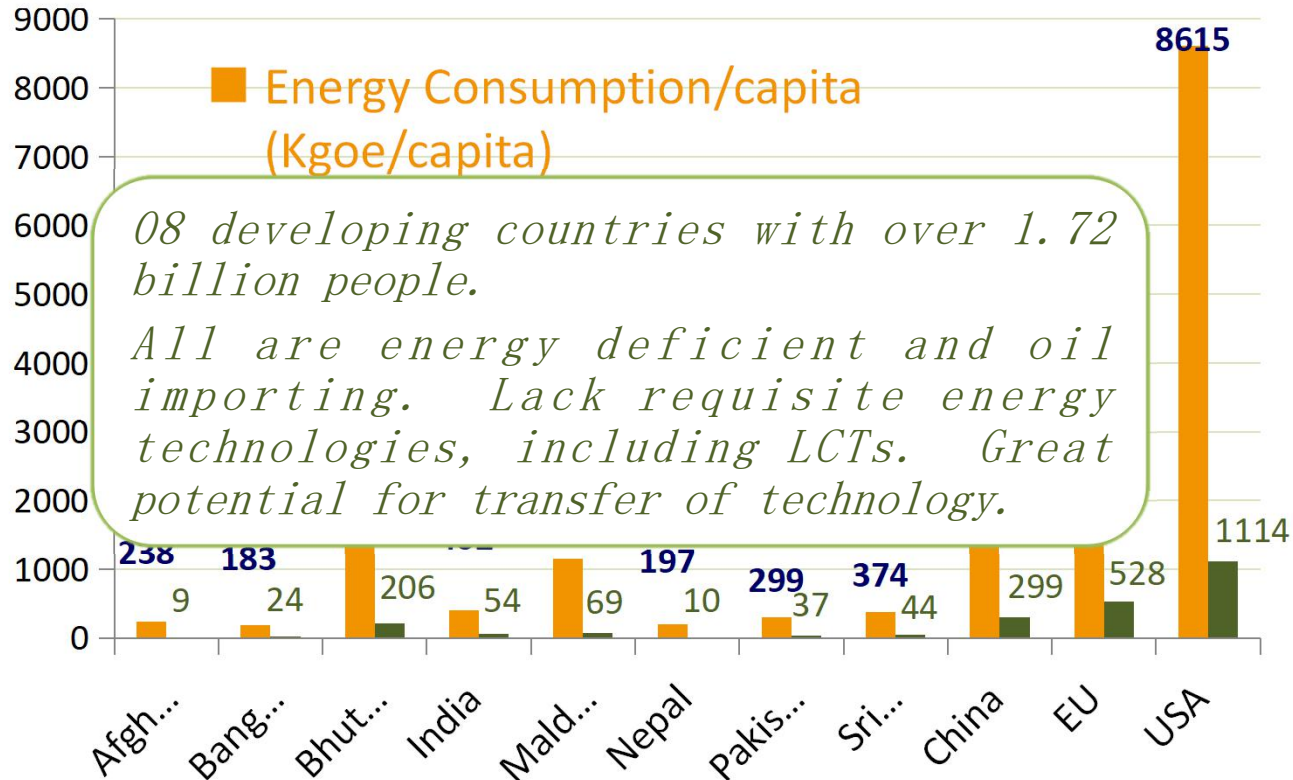
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THANK YOU FOR KIND ATTENTION
谢谢您的关注!

Per Capita Energy Consumption in South Asia





China tops all developing countries in having successful Transfers of Technology from Advanced World



India performed better within South Asian countries

Generally the success rate for ToT in South Asian countries had been low

ToT Success in Developing Countries

South Asia Regional Technology Requirement



- *Over 1.72 billion people*
- *08 developing countries*
- *All are energy deficient and oil importing. Lack requisite energy technologies, including LCTs. Great potential for transfer of technology.*

*Flow of technology, service
and skills from source*



*recipient (developing country) through an agreement,
trade, training, exhibition, movement of people, etc.*



Many a times a third party is involved to
facilitate ToT process

Transfer of Technology (ToT)



If a ToT arrangement reasonably achieves these benefits, especially for the developing country, it is taken as success

ToT
SUCCESSFUL or UNSUCCESSFUL