

# **Transfer and Commercialization of Green Technologies: Challenges and Opportunities**

“Opportunities and challenges in the Transfer  
and Adoption of Green Technologies”

**Eng. WJLS Fernando**, Chairman, National  
Engineering Research and Development  
Centre (NERDC), Sri Lanka,

# Sri Lanka being a signatory to the UN declaration of 2030 Agenda for Sustainable Development

- envisions about 20% reduction of GHGs by 2030 from the Business As Usual Case of which 4% is unconditional while 16% is conditional.
- The most recent budget proposals of Sri Lanka presented to the Parliament in November 2017, the Hon. Minister of Finance stated “ Mr Speaker, as the President assured at the 70th Session of the United Nations General Assembly in September 2015, Sri Lanka is firmly committed towards the Post-2015 Sustainable Development Agenda and the Sustainable Development Goals (SDGs). As such, the Budget I present today is based on the principles of SDGs.”

# Budget Proposals for 2018 :

## Blue – Green Economy for Sri Lanka

“ Mr Speaker, I now present the Budget 2018 under the theme of “Blue - Green Budget; the Launch of Enterprise Sri Lanka”. It is “Blue” because we plan to integrate the full economic potential of ocean related activities in formulating the overall growth strategy. It is “Green” because we build our economy on an environmentally sustainable development strategy. The “Enterprise Sri Lanka” will reawaken the entrepreneurial spirit coming from our ancient forefathers enabling Sri Lanka to be a vibrant trading hub and encouraging all Sri Lankans to become co-owners of a country enriched. “

# How Can Sri Lanka as an Island nation with many challenges achieve such high ideals

- only through inventions, innovations and entrepreneurship that we can look ahead of achieving such aspirations of our leaders
- All policy documents and literature: Sri Lanka is striving to achieve Economically feasible, Socially equitable and Environmentally sustainable development.
- The difference however is that the private sector spurred by government patronage and recently announced policy regimes has come forward to making these objectives a reality. SLASSCOM has an aspiration of achieving \$ 5 Billion in Export Revenue and creating 200,000 direct and indirect employment opportunities in the IT/BPM industry by 2022....
- Energy, Industry ,Agriculture,, Transport is following suit

# Green Technology in Energy Sector

- The renewable energy share in the primary energy supply including biomass and hydro has dropped from about 80% in the late 1970s to about 48% in 2015
- “National Energy Policy and Strategies of Sri Lanka” states: “A paradigm shift of policy is envisaged to defend and improve the share of renewables in the primary energy supply from the 55% level maintained during the last decade. “

# Intended Nationally Determined Contributions (INDCs) according to Paris agreement ( COP 21) and SDGs the following targets are envisioned :

- Establishment of large scale Wind Farms - Sri Lanka has a potential of about 6000MW commercially exploitable wind potential.
- Broadening the use of Solar Power to be connected to the National Grid by dedicated power plants as well as solar roof tops named “ Soorya Bala Sangramaya ” – initiated by the President in 2015 that has yielded results with 100 MW of installed capacity in this short period of time.
- Use of Biomass industrial, and agricultural waste in the power generation mainly through the intervention of Private sector.
- Continue the development of mini, micro hydro power plants in a sustainable manner through the private sector. Most of the major hydro plants are already developed by the utility and approximately 450 MW small hydro power has already been developed by the private sector.
- Introduction of DSM measures in the industry commercial and domestic sector with special emphasis on BMS.
- Ensure 50% Non Conventional Renewable Energy (Other than major Hydro which already has a 40% share ) absorption to the National Grid by 2030

# Opportunities for Innovation and Entrepreneurship

- Role of electricity will be recognised as the dominant energy carrier of the future, and strategic ventures to utilise local resources in energy conversion and storage equipment will be nurtured as an industrialisation thrust.
- Development of novel ICT applications such as for power system automation, remote control, distributed real time event and data acquisition systems and smart metering for the energy sector will be encouraged.
- Sri Lankan engineering enterprises will be encouraged to engage in energy sector infrastructure development.  
Research and development on introducing, adopting and implementing new and emerging renewable fuel source, efficient energy conversion and end use technologies will be promoted.
- Innovation will be facilitated by providing protection to intellectual property and safeguarding the same until commercialisation and nurturing nascent technologies by financial incentives and tax benefits.
- Indigenous knowledge and capacities required for energy sector development will be realised.
- Potential offered by vehicle Energy Storage Systems (ESS) will be studied considering the potential offered as a local standby energy storage device, deploying those as an Automated Demand Response (ADR) option and a load profile management tool.
- Small scale on-grid distributed and off-grid stand-alone applications using renewable energy with local value addition will be encouraged as an economic development thrust.

# Opportunities for Innovation and Entrepreneurship

- A 25% local preference will be granted to Sri Lankan engineering enterprises to encourage such enterprises to engage in energy sector infrastructure development from 2018
- A coordinated R&D network involving all research and development organisations will be established by SEA, assembling both industry and academia in a grand alliance within 2018, and ten pilot projects on home grown renewable energy conversion technologies and ten energy efficiency improvement technologies will be introduced by SEA by end 2020, protecting intellectual properties amassed until commercialization.
- Smart grids will be deployed in five pilot projects to demonstrate the possibilities of better management of generation, transmission and distribution assets, to allow new and present customers to use electricity in the most efficient manner and to allow large scale / deep penetrated deployment of dispersed NRE generators using advanced ICT in measurement, control and management of electrical grids by end 2018 by CEB/LECO. An automated demand response pilot project will be implemented and impacts documented to allow economic evaluation of the same as a future generation option by end 2019 by CEB/LECO.
- Indigenous knowledge and capacities required for energy sector development will be nurtured by introducing a contribution based reward scheme to encourage individual efforts by sector professionals and pooling of knowledge resources across the energy sector by end 2018.

# **Opportunities for Technology Transfer and for SME to be engaged in National Economic Development.**

- creating a very healthy environment for foreign investment inflows, the engagement of local businessmen in the leadership of these initiatives.
- There are many initiatives of Free Trade Agreements already in force and some are being refashioned to attract even more collaboration in some niche areas of development.
- The government is planning to set up 45 high economic development zones and 11 Industrial and Technical zones. Sri Lanka's position in the World Bank's "Ease of Doing Business has been climbing up in ladder.

# National Initiatives

- The Ministry of Trade and Commerce in their latest document on “National Policy Framework for Small Medium Enterprise (SME) Development “ states
- “The vision of the National SME Policy Framework is to create significant number of globally competitive, dynamic, innovative, technologically driven, **eco-friendly** and **sustainable** SMEs that contribute greatly to the national economic development.
- The mission of the National SME Policy Framework is designed to stimulate growth of SMEs to produce world class products and services that can compete locally and internationally with supportive enabling environment and **interventions of technology transfer**, entrepreneur culture, skills development, access to finance, market facilitation and **research and development**. “ Further the policy framework is aimed at Transforming the landscape of the SMEs ... high value addition, innovative and usage of modern appropriate technology. It specifically talks about promoting resource efficiency at all levels including the use of **Green Technology**.

# Barriers, Obstacles and Challenges to promote Transfer and Commercialisation of Green Technologies

- Lack of Technical Expertise in selecting Green Technologies suitable to a specific Industry/ process. This can be a major challenge as it has sometimes been proven that the expected paybacks in utilizing Green Technologies are not always forthcoming. Hence some interventions are more harmful than otherwise.
- Lack of local Investors willing to back entrepreneurs promoting Green Technologies. For that matter it is seen majority of funding of start ups have come from savings, family or friends (62% ). Such ventures do not necessarily do well in the long run. This trend does not augur well for the industry.
- Business Costs lack of suitable space in an environment that will cater to a variety of needs in the same locality.
- Lack of incubator facility.
- Difficulty of fund transfers through payment gateways etc.

The government has taken steps to establish industry incubators to assist innovators and entrepreneurs to embark on initiatives

- Government has supported Product Design Engineering (PDE) through the establishment of a fund and continues to support the PDE initiative through the Mechatronic Enabled Economic Development Initiative (MEDI) which will consist of the shared services in Standards, Training, Prototyping and Test Facility (SPTF) and the Long Term Loan Facility (LTLF). Interestingly The NERDC has been identified as the host institution for SPTF and we have already commenced discussions with University of Moratuwa to collaborate with us.

# The government Initiatives and APCTT

- The government has proposed to establish a National Level enterprise known as “ National Science Technology & Innovation Coordinating Authority (NASTICA) which will be dedicated to convert research into commercial ventures. There are many Green Enterprise not only in the Industry, Energy, Agriculture sectors but also there are initiatives to manufacture solar cells using non silicon base materials with high levels of conversion efficiencies
- Hence it is most appropriate that we deliberate today at very high level, The transfer, exploitation and commercialization of green technologies to advance Sustainable Development.
- In conclusion let me assure that in Sri Lanka, the government is not only keen to green the economy but is equally keen to initiate R& D to develop Green Technologies as well. Technology Transfer among member countries of APCTT hence is most welcome and Sri Lanka will actively participate in this initiative.