



SUSTAINABLE MANUFACTURING IN TRINIDAD & TOBAGO

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Sustainable Manufacturing & Climate Change

- Recent Copenhagen Accord:
 - Entailed agreement that “deep cuts in global emissions are required according to sciencewith a view to reduce global emissions by 50 per cent in 2050 below 1990 levels, taking into account the right to equitable access to atmospheric space.”
- T&T’s manufacturing sector
 - 30% of national energy consumption
 - 25% of national carbon emissions
 - Local responsibility for leading regional role in Green Manufacturing.



Overview - T&T Manufacturing Sector

- Trinidad and Tobago manufacturing sector began its growth and development in the 1980s
 - Economic insignificance then, relative to the fossil fuel energy sector.
 - Import controls were used by the government to allow infant industries to grow.
 - Downstream petrochemical sector, iron and steel production, the food and beverage sector were the main offspring of a burgeoning manufacturing sector.



Overview - T&T Manufacturing Sector

- T&T manufacturing sector – one of the largest and most vibrant within Caricom.
- Sub-sectors: Food, Beverage and Tobacco, Printing and Packaging, Chemicals and Non-Metallic Materials, Assembly Type and Related Industries, Construction etc.
- Manufacturing sector's contribution to GDP: average 7% (2000 – 2009) Central Statistical Office data
 - ▣ Critical to the future economic growth of T&T.



Overview - T&T Manufacturing Sector

- Manufacturing sector employment - in excess of 50,000 persons (2005 – 2009). High % of total labour force.
- Sector growth attributable to the strength of the energy sector.
- Mainstay of the local economy - natural gas.
- Manufacturers therefore have access to relatively inexpensive energy to power industrial production.
- Low electricity costs per kilowatt hour - tremendous competitive advantage in the region.



Sustainable Manufacturing

- 21st century industrial policy for the Trinidad and Tobago economy must not continue to be driven by reliance on fossil fuel energy.
- The manufacturing sector will be sustained by a balance between:
 - The existent fossil fuel sector
 - Renewable energy industries
 - The use of energy efficient technologies
 - Methods of production designed to minimize waste
- Ultimate goal: to initiate, groom and develop local companies into ‘Green businesses.’



Sustainable Manufacturing

- TTMA envisions Trinidad and Tobago as a regional hub for Green Manufacturing.
- Considerable economic advantages, low energy costs.
- Critical starting point: creating a legislative, policy and institutional framework.
 - ▣ Backbone for a sustainable manufacturing sector.



Sustainable Manufacturing - Policy & Legislative framework

National Government must determine:

- The role of sustainable manufacturing in national development.
- Renewable energy industries earmarked for development.
- The timetable for implementation.
- Infrastructural framework giving rise to these industries.
- Incentives to existing/potential entrepreneurs.
- Legislative changes mandating producers to utilize renewable energy in production.



TTMA Position – Build a Solar Manufacturing Industry

‘With consideration for the various renewable energy alternatives, the Solar Photovoltaic (PV) industry holds the greatest potential for development locally. The current nature of the global PV market, the local abundance of natural gas (a major input into the solar module development process), the revenue generating capacity, and the business and job opportunities that it creates certainly lend credence to this assertion. To thrust it into reality, Trinidad and Tobago will need an aggressive PV development strategy, starting with its inclusion into the Vision 2020 development framework.’

Source: TTMA Position on Renewable Energy – A Focus on Solar Photovoltaics



TTMA Position – Build a Solar Manufacturing Industry

Rationale:

- High revenue and employment at each stage of the value chain.
- Rapid projected growth of the global PV industry.
- Importance of an aggressive Photovoltaic strategy.
- Benefits justify considerable public and private sector investment.
- Availability of natural gas required to convert sand to silicon.
- Natural gas can be used to progressively balance the renewable and non-renewable energy sectors.



TTMA Position – Build a Solar Manufacturing Industry

Rationale (cont'd)

- Excess energy generated in residential and commercial grid connected systems.
 - Sold to local electricity companies - further reductions in electricity costs.
 - End result: environmentally friendly goods and services that are more competitive.
- Table outlining solar industry projections to the year 2020 (next slide)



TTMA Position – Build a Solar Manufacturing Industry

Solar Industry	2020 Projections
PV Module Output	2,000MWp
Silicon Output	20,000 tons
PV Manufacturing jobs	7,000
Revenues	2,000 million US\$ / yr
Land Area requirement	200ha
CAPEX	500 mm US\$/yr
Gas Consumption	50 mm scfd
Electricity	330MW

Table extracted from the November 2006 UTT / R&D report entitled, 'Building a Photovoltaic Industry in Trinidad and Tobago.'



TTMA Position – Build a Solar Manufacturing Industry

- Solar Photovoltaic Module Development:
 - 1. Refining of sand into silicon.
 - 2. Growing solar crystals from the silica and slicing into wafers.
 - 3. PV cell manufacturing.
 - 4. Module assembly and installation of PV systems.



TTMA Position – Build a Solar Manufacturing Industry

- Opportunities for the manufacturing of, inter alia:
 - Solar wafers, solar cells, modules, glass and substrate, electrical distribution component development.
 - Sub Sector firms viz. assembly-type & related industries, construction and transportation provide base level capacity for manufacturing PV components.
 - Right investment and incentives - new industries across the value chain will emerge.



Local Challenges & Incentives Needed

Challenges:

- T&T context - Low energy costs: little compulsion for urgent renewable policy action.
- Prospect of long term competitiveness does not incentivize/encourage private investment.
 - Private sector concern: length of payback period.

Incentives:

- Feed-in tariffs.
- Tax breaks.
- Leasing of land space for solar energy plants.
- Penalties for breeches to new legislation – must motivate full compliance in the future.



Sustainable Manufacturing & Climate Change Revisited

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Summary

- The compelling force for Sustainable Manufacturing in T&T therefore entails:
 - ▣ Policy and legislation, incorporating incentives and appropriate penalties for breeches
 - ▣ New Research & Development.
 - ▣ Public investment.
 - ▣ Mitigating the effects of climate change.
 - ▣ Contributing to regional sustainable development.





THANK YOU!

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