

NATIONAL ENERGY RESEARCH GROUP (NERG)

A Coordinated Research Perspective on Sustainable Buildings in Mauritius

Mauritius Research Council



February 2, 2012

Outline of the Presentation

- **Status on Building Sector in Mauritius**
- **Barriers identified in the building sector**
- **Need for Sustainable Buildings in Mauritius**
- **What is Sustainable Building?**
- **Why National Energy Research Group?**
- **Process of setting-up of NERG**
- **NERG – Research themes identified**
- **NERG – Research topics identified**

Status on Building Sector in Mauritius

- Mauritius, a Small Island Developing States (SIDS), has limited land, a fragile ecology and is one of the most densely populated island in the world (with about 626 persons per square km)
- **25%** built-up areas in Mauritius
- **87%** concrete buildings
- **7, 000** and **10, 000** building permits issued per year
- **1000 ha** of residential space are granted each year

Status on Building Sector in Mauritius

- About **140,000** new housing units required between 2000 and **2020**
- Growing demand for services like air-conditioning, heating, computers and electric equipment
- Increased energy use in buildings
- Profound modifications to our land regime due to new investment sectors
- Affecting long term environmental sustainability

Barriers identified in the building sector

- Lack of a shared vision on sustainable buildings for Mauritius
- Appraisal/permitting process does not give credit to sustainable buildings
- Absence of building codes and incentives to promote sustainable buildings
- Existing Building Act does not set the standard for sustainable buildings

Barriers identified in the building sector

- Lack of proper enforcement of guidelines and legislation
- Lack of public awareness and lack of client demand - 80% of all buildings designed without architects
- Cultural resistance to change in the way buildings are done
- Lack of analytical tools and data to evaluate the socio-economic benefits of sustainable buildings

Need for Sustainable Buildings in Mauritius

- Building sector consumes as much as 40% of the world's energy, 12% of its potable water and contributes up to 70% of solid waste
- Buildings account for one-third of all GHGs worldwide
- Current status - 85% of our stock built without or with very little consideration laid on sustainability
- Greening of buildings - a necessity to drive energy consumption down in Mauritius
- Contribute to helping meet aggressive government targets for carbon reduction and 65% energy autonomy by the year 2028

What is Sustainable Building?



A sustainable building focuses on increasing the **efficiency of resource use**, while **reducing** building **impact** on **human health** and the **environment** during the building's lifecycle through better design, construction, operation and maintenance.

Benefits of Sustainable Building

- Reduce the impacts of natural resource consumption
 - minimise energy requirements
 - reduce water consumption
 - reduce wastage
 - use of materials which have low environmental impact and
 - conserving the natural environment
- Enhance occupant comfort, health, productivity and improve quality of life
- Increase building valuation and Return on Investment (ROI) (Green investment could pay for themselves in about 3 years, annual ROI 25-40%)
- Contribute to the Maurice Ile Durable (MID) vision



Some ongoing National Projects/ Initiatives related to Sustainable Building

- *Removal of Barriers to Energy Efficiency and Energy Conservation in Building in Mauritius, Rodrigues and Agalega - to reduce GHG emissions sustainably through a transformation of the building energy efficiency market for existing and new buildings (UNDP-GEF/ MEPU)*
- *National Programme on Sustainable Consumption & Production - Action Plan on Sustainable Building and Construction (2008 – 2013) (MoESD/UNEP)*
- *Development of a national policy, guidelines and rating system for sustainable buildings and construction (EU/MoESD & MPI)*
- *Recommendations of the MID Working group on Energy with a section on buildings (MID/MoESD)*

Private Sector Initiatives



Setting-up of National Energy Research Group (NERG)

8th September 2011

Background

- Directed by the Ministry of Tertiary Education, Science, Research and Technology, the Mauritius Research Council has set up a National Energy Research Group (NERG), comprising experts from the public and private sectors to address the energy issue from a coordinated research perspective
- NERG: officially launched by Dr The Hon Rajeshwar Jeetah, Minister for Tertiary Education, Science, Research and Technology, on the 8th September 2011

Why Energy Research Group?

- The main aim of NERG is to provide a platform whereby several research ideas from both the public and private sectors regarding sustainable and positive-energy buildings in Mauritius were discussed.
- Although the scope of work of the group covers the entire energy issue, the initial initiative of the group was restricted to energy-efficient buildings due to the vastness of the topic.

Objectives of the Energy Research Group

1. To take cognizance of the existing initiatives/ measures on sustainable buildings with emphasis on positive renewable energy buildings in Mauritius
2. To establish a dynamic energy research alliance in Mauritius regrouping private and public sector stakeholders
3. To identify research gaps, overlapping/critical research issues on sustainable and positive buildings in Mauritius
4. To prioritise research themes in sustainable and positive buildings
5. To coordinate and facilitate research activities on sustainable and positive buildings in Mauritius
6. To make recommendations to the policy makers with respect to the research findings

Members of Energy Research Group

1. Ministry of Energy and Public Utilities (MEPU)
2. Ministry of Environment & Sustainable Development (MoESD)
3. Ministry of Public Infrastructure, NDU, Land Transport & Shipping (MPI, LT&S)
4. Ministry of Housing and Lands (MH&L)
5. Ministry of Local Government & Outer Islands (MLG&OI)
6. Mauritius Standards Bureau (MSB)
7. Mauritius Academy of Science and Technology (MAST)
8. Mauritius Port Authority (MPA)
9. United Nations Development Program (UNDP)
10. University of Mauritius (UOM)
11. University of Technology, Mauritius (UTM)
12. Ecosis Ltd
13. ProDesign Sustainability & MEP Engineers
14. Mauritius Architects Association (MAA)
15. National Housing Development Company Ltd (NHDC)
16. Central Electricity Board (CEB)

Consultative Process

- Workshop held to take stock of the existing initiatives/ measures on SB
- Views of members sought on critical issues and proposed research areas related to SB in Mauritius
- Information available from stakeholders was compiled
- Analysis of the energy and construction issues in Mauritius was carried out
- A list of prioritised projects was drawn
- A draft report prepared on the issues highlighted along with the emerging research themes and areas on SB

NERG: Research Theme 1

Building Design & Materials



Theme1: Building Design & Materials

Assessing benefits of green roofs in Mauritius



Natural heating/cooling;
Lower our carbon footprint

R&D into possible sustainable materials for the construction industry



Resist cyclones; Keep the temperature and relative humidity at comfort level

Baseline data on building design & materials

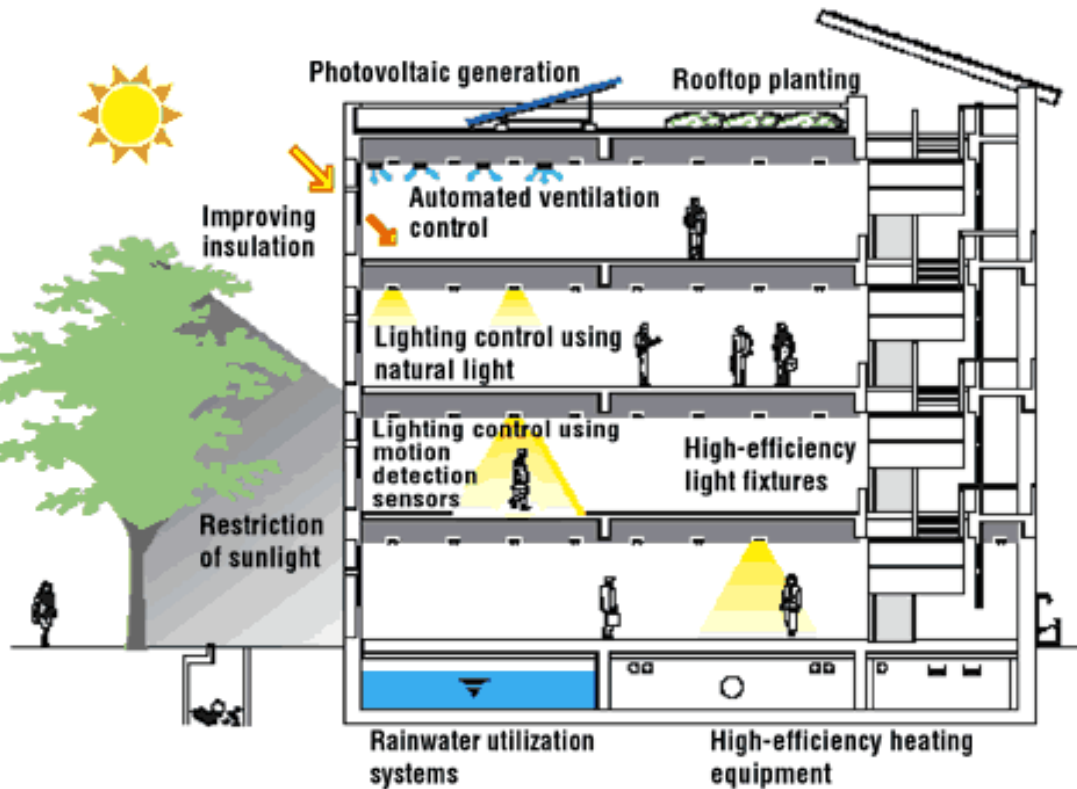


To provide standardised valuable information

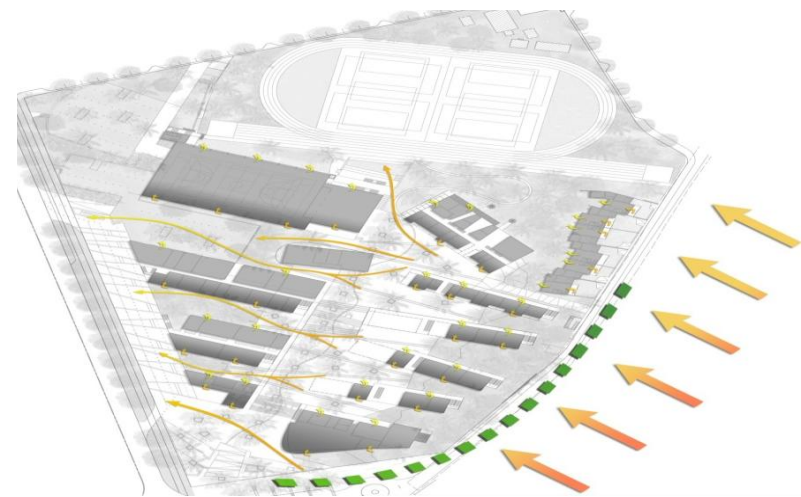
Lack of research for new local materials which are more appropriate to the local context and which are more cost-effective, MID WG report on Energy, August 2011

NERG: Research Theme 2

Heating/Cooling Systems



Conceptual Drawing of Green Building



Theme 2: Heating/Cooling Systems

Assessing the impacts of air-conditioners and ways to reduce our dependency



National Strategy towards an Air-Conditioner Free Society

Application of funneling effect



For cooling and dehumidification

Baseline data collection & best practices



To provide standardised valuable information

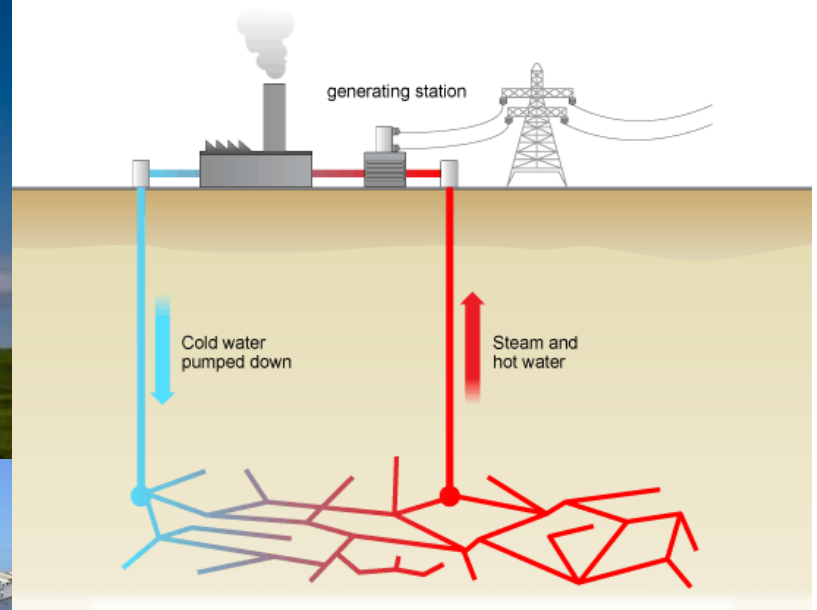
Study the best paints and insulating materials for heat reflection



Keep temperature and relative humidity at comfort levels

NERG: Research Theme 3

Green Electricity Generation



Theme 3: Green Electricity Generation

Assessment of wind energy locally to develop wind maps



Electricity

Geothermal Energy



Electricity;
Heating/Cooling

Baseline data on green electricity generation



To provide standardised
valuable information

NERG: Research Theme 4

Green Building Technologies & Environment



Theme 4: Green Technologies and Environment

Baseline data on green technologies and environment



To provide standardised valuable information

Study the best plants for shadow purposes



Natural cooling

Study on green technologies



Electricity;
Heating/Cooling

Way Forward

- The NERG will now call for research proposals in the priority themes/ areas and topics identified
- Thereafter, sub-research groups will be assembled within the NERG to coordinate and facilitate the research work
- It is envisaged that these studies will provide valuable information to help the country meet its objectives for long-term sustainability and realisation of the Maurice Ile Durable concept.

Acknowledgement

- Guest Speakers during the workshop
 - Dr P M K Soonarane, Ministry of Energy and Public Utilities
 - Mr V Bhujun, ProDesign Sustainability & MEP Engineers
 - Mr Tony Lee Luen Len, ECOSIS Ltd
 - Mr R Ramjit & Mr D Seeburrin, Ministry of Public Infrastructure, NDU, Land Transport and Shipping
- Members of the National Energy Research Group
- Mr Ashwin Kathapermall & Vikheel Chuttur, MRC

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Thank you for your attention



Question & Answers

