NM0328: MASDAR Experience

Why we proposed NM0328

Main Issues

Possible solutions

Discussion
Why we proposed NM0328

- Buildings/residential sector is major energy consuming and there was a need to look into this sector to mitigate the climate change

- Masdar started integrated approach for energy efficient living which includes all the sector:
  - Energy efficient building Architecture
  - Energy consumption in the utilities supplying heating/cooling in the building (Chillers/heaters)
  - Efficient transportation
  - Efficient water and waste management
  - Green Energy Source
  - Human resources & Financial tools for Sustainable development
Why we proposed NM0328

To promote sustainable living Masdar proposed the methodology with the help of Perspective. The main motive for that was

- To promote the low carbon/sustainable city development
- To help project promoters to claim revenue from CDM for the additional investment in energy efficient aspects.
Buildings Code: MEDG*

Building System
- Envelope
- HVAC
- DHW
- Power
- Lighting
- Other

Mandatory Provisions
(required for both compliance options)

Design Options
- Prescriptive Option
- Model-Based Option
- Proposed ≤ Mandatory + Prescriptive

MEDG* Compliance

* Masdar Energy Design Guidelines

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Buildings non-cooling load

How best to control end-use habits/profile?

• Only high efficient light sources (at least 80 lm/W)
• Installed light capacities below 10 W/m² with integrated daylight control, shut off above 400 Lux
• Mostly thin client laptop computers with LCD screens
• Low-power server equipment (“green data centers”)
• Highly efficient appliances (A+++)
• Smart appliances (pilot project with GE)
• Biogas cookers under evaluation
• Dish washers & washing machines to be connected to central hot water system
• Demand controlled ventilation
Smart Appliances

Wireless smart appliances controller

Environment and Load Monitoring

Lighting, Water and Cooling

Manual Control

Direct Control and Preset Preferences

User Interface

Preferences, Transactions

Incentive Signals, Account Info, Load Data

BMS

System Operator

Centrally Administered Set points

User Adjusted Set points (priority)
Energy Model

• A city-wide dynamic model is composed of several specialized modules (buildings, people behavior, district cooling, supply, distribution, etc)

• The model will primarily simulate energy flow but could be later extended to include water, wastewater, transportation, etc

• The model will be used
  – As a decision support tool during design/construction of the city to optimize utilities integration and minimize supply/demand gap (generate “what-if” scenarios and select the alternative which optimizes energy/cost/carbon)
  – As an operational tool after construction of the city: forecasting, detection/diagnosis, predictive control
Main Issues – Part 1

Baseline

— What should be the Benchmark/Baseline
  » Government data/Benchmark
  » Survey on similar type of buildings
  » International benchmarks etc

— Building Classification
  » How to classify the buildings / building units
  » How to get the similar climate/socio economic classification

— Data for Baseline building units
  » From where to get the data on the age of building and energy consultation
  » Credibility of the data
Main issues – Part 2

**Additionality**

- How to demonstrate ??
  - Only emission additionality or financial/technical as well
  - Application of tool or proposing new tool
  - An integrated approach or discrete technology-wise demonstration
  - Impact on the similar projects in the host country/region
  - Data/cost involved in the demonstration of additionality
Main issues – Part 3

Monitoring

- What all parameters to be monitored – Is area monitoring required in the crediting period
- Frequency on monitoring - baseline building units
- What if some one refuses to give the permission of data in next monitoring
- Cost of monitoring
- Is it worth to go for CDM?? Cost vs Benefit
Application of Methodology

- Replicability
- Cost of monitoring and CER issuance
- As PoA
- Initial step for NAMA/Sectoral Benchmark
- Limitation for using in village based housing?