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# The Roles of Standards in Greening Infrastructure: Global and Local Practice

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# Introduction

- Green infrastructure is a key global priority of the 21st Century
- Global energy demand has outpaced the capacity of new supply to reach markets
- The world is facing unprecedented energy challenges
- The significance of energy efficiency is widely recognized today, as the entire world is challenged by both climate change and concerns over energy security.
- More than just an environmental issue, energy management is equally an economic and social issue. In essence, energy management supports the three pillars of sustainability:  Economy, Environment and Society

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# Introduction

- In South Africa – Demand is greater than Supply
- The reduction of greenhouse gas (GHG) emissions is an urgent concern in SA, a country that is one of the greatest $CO_2$ emitters globally per capita
- Most of South Africa's electricity consumption is for heating, cooling, ventilation and hot water
- The construction of energy efficient buildings will significantly contribute to the reduction of GHG emissions.
- Drivers for energy use – comfort, safety and security
- Right to live and work in safe environment

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# Role of Standards in Green Infrastructure

Standards are created by the very organizations that need to use them, and are created in an open, consensus-driven process.

Standards are recognized as efficient tools to reduce uncertainty for all economic players.

Standards will make efficiency measures more reliable and competitive in green infrastructure management and public administration.

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# Role of Standards

- Encouragement of new green infrastructure projects and policy instruments
- Facilitation of access to new energy savings markets
- Increased awareness of energy efficiency measures among providers and users
- Acceptance of green infrastructure products with high added value
- Solid support for greenhouse gas emission reductions.

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# Snap-shot
## International Trends

**Green buildings:**

- **Countries around the world has taken the first steps to introduce measures for green infrastructure**
  - **Australia – Introduced the Nabers system**
  - **Singapore – BCA Green Mark Scheme**
  - **Indonesia**
  - **USA**
  - **India**
  - **Many others**
- **Emphasis shifting towards components/Appliances**
- **Energy star rating introduced in most parts of the world**
  - **Accepted in, USA, Canada, Japan, New Zealand, Taiwan, and EU**
- **Heating and cooling systems**
- **Lighting**

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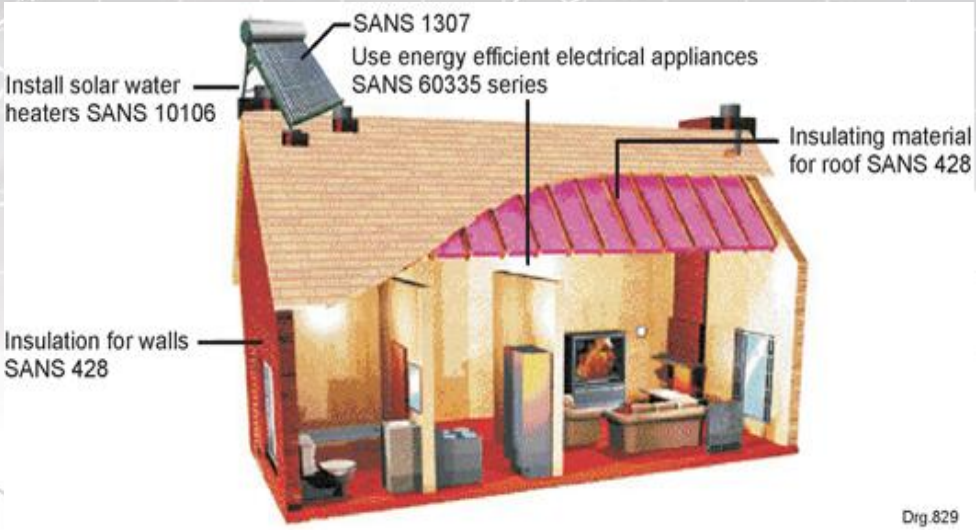
# Snap Shot- Local Best Practices

## ❖ Local Trends

- Government driven policy for energy efficiency
  - Introduction of stds for buildings – SANS 204, SANS 10400-XA
- Performance of solar water heating – Mechanical and thermal performance
  - SANS 1307, *Domestic solar water heaters* developed
- Regulation of Solar water heaters under consideration

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# SANS 204:2011

- The standard addresses the following areas in buildings:
  - Site orientation
  - Building orientation
  - Shading
  - Building design - floors, external walls, fenestration, roof assemblies, roof lights
  - Building sealing – building envelope, air infiltration and leakage, permissible air leakage

# Other Standards

- Green Infrastructure is associated with a variety of environmental, economic, and human health benefits, many of which go hand-in-hand with one another.
- The benefits of green infrastructure are particularly accentuated in urban and suburban areas where green space is limited and environmental damage is more extensive. Green infrastructure benefits include:

- Reduced and Delayed Stormwater Runoff Volumes
- Stormwater Pollutant Reductions
- Improved Human Health
- Increased Carbon Sequestration
- Urban Heat Island Mitigation and Reduced Energy Demands
- Improved Air Quality

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# Local Best Practices

## Water Efficiency Drive

- South Africa is a semi-arid country
- Freshwater is our most limiting natural resource. receive only around half the average rainfall of other countries
- Water will increasingly becoming the limiting resource in South Africa, and supply will become a major restriction to the future socio-economic development of the country
- Water availability now and in the future is heavily dependent on climate, water use and management and land-use practices

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# Local Best Practices

## Development of standards for water conservation

SANS 10252-1, Water supply and drainage for buildings Part 1: Water supply installations for buildings.

SANS 10254, The installation, maintenance, replacement and repair of fixed electric storage water heating systems

SANS 1352, The installation, maintenance, replacement and repair of domestic air source water heating heat pump systems

# Eco- system Preservation

- SANS 14064 series – Greenhouse gases – quantification, reporting, monitoring of GHG emission reductions

- SANS 14065, Greenhouse gases - Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition

- SANS 14066, Greenhouse gases - Competence requirements for greenhouse gas validation teams and verification teams

The newly published ISO 14006:2011, *Environmental management systems – Guidelines for incorporating ecodesign*, gives "how to" guidance to product and service organizations on incorporating ecodesign into any environmental, quality or similar management system.

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# SANS 10400 – XA The application of the National Building Regulation

## Part X Environmental sustainability

## Part XA Energy usage in buildings

# SANS 10400 – XA The application of the National Building Regulation Part X Environmental sustainability Part XA Energy usage in buildings

- SANS 10400-XA is a single reference for stakeholders to ensure compliance with energy efficiency requirements as per the NBR
- Many South African National Standards developed to support energy efficiency and energy savings applications
- National Building Regulation Part XA, supported by SANS 10400-XA incorporates existing standards into holistic overview of building construction
- Addresses energy consumption and energy

# SANS 10400 – XA (cont)

- Further requirements are set for
- Orientation of building – well-used areas facing north
- Roof and ceiling thermal performance – roof overhangs
- Fenestration – to allow sun and light without compromising natural warmth (for winter) or coolness (for summer)
- Use of appropriate heating, ventilation and ac – where required
- SWH installation mandatory for new buildings

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# SANS 50001 – Energy Management System

# SANS 50001

- SANS 50001 will provide organizations and companies with technical and management strategies to increase energy efficiency, reduce costs, and improve environmental performance.

- The standard is intended to provide organizations and companies with a framework for integrating energy efficiency into their management practices. Provides the basis for a logical and consistent methodology for identifying and implementing improvements.

- The standard could influence up to 60 % of the world's energy demand primarily targeted the commercial and industrial sectors.

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# SANS / ISO 50001 - Energy management systems

- ISO 50001 is based on the same Plan-Do-Check-Act approach of ISO 9001 and ISO 14001 and it draws extensively on the structure and content of the QMS and EMS.

- However, the implementation and dissemination of ISO 50001 is likely to confront differently with a number issues, including the following:
  - Laws and regulations
  - Market drive
  - Certification program support
  - Technical support

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# … Renewable Energy

"Renewable energy " is energy that is derived from natural processes that are replenished at a higher rate than they are consumed. Solar, wind, geothermal, hydro, and biomass are common sources of renewable energy"

According to the International Energy Agency's *Clean Energy Progress Report 2011*, renewable energy has seen 30 % to 40 % growth rates in recent years, due to market-creating policies and cost reductions.


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# SANS 50001 – Measurement and verification of energy savingsConclusions

- Main objective – To provide a standardised approach on the reporting of calculated energy savings to benefit from tax incentives

  - Main Clauses
    - Determination of Energy Savings
    - Measurement Methodology
    - Measurement of Variables

  Referenced in the draft Regulations to the Energy Act on the allowance for energy efficiency savings – Currently out for comment (closing 16 Oct)

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# Conclusions

- Standards are a glue that holds together the technological advancement in sustainability
- Partnerships with all relevant stakeholders is key
- The voluntary use of standards is key towards the attainment of a sustainable green infrastructure

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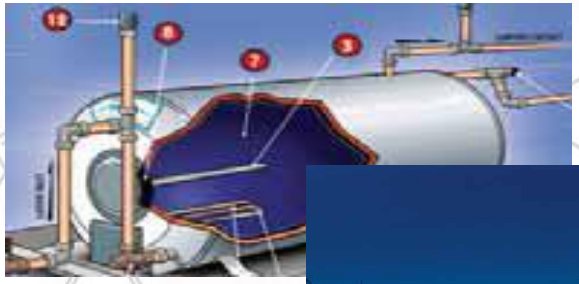
# Thank You

# Case Study

- Pilot implementation programmes by US industrial companies in order to encourage energy efficient manufacturing, and promote verifiable improvements in energy performance.
- Some 25 companies across 14 US states are taking part, seeking to learn more about developing and implementing an energy management system that meets the highest standards in energy efficiency.
- The programme is designed to encourage a shift in how energy is managed at the facility level by providing companies and staff with a roadmap toward ongoing energy management improvement, thus helping companies to save money, save energy, and improve their competitiveness.



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