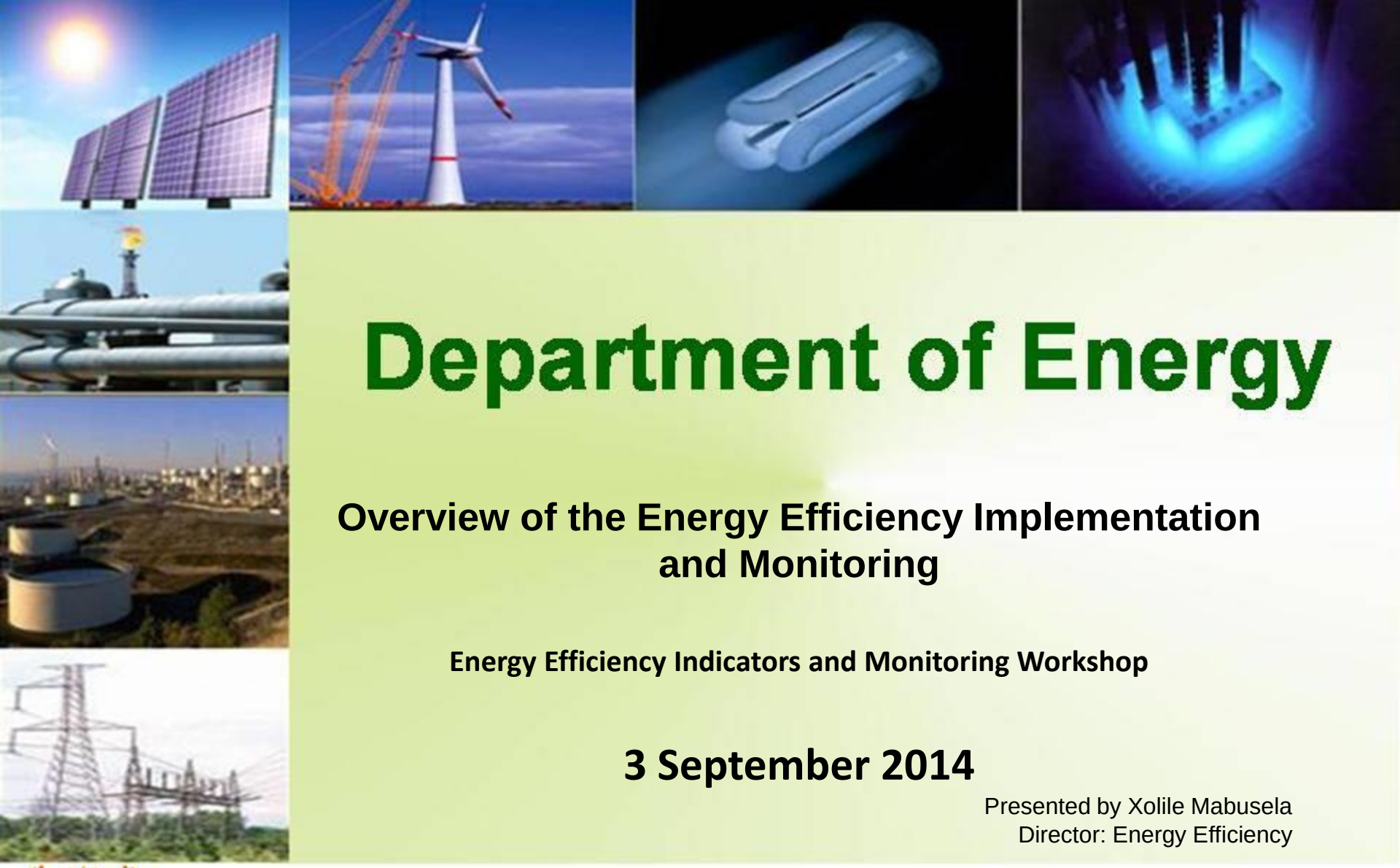

Department of Energy

Overview of the Energy Efficiency Implementation and Monitoring

Energy Efficiency Indicators and Monitoring Workshop

3 September 2014

Presented by Xolile Mabusela
Director: Energy Efficiency

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Outline

1. National Energy Efficiency Strategy
3. National Energy Efficiency Options
4. Specific EE measures
5. EE in Public Buildings
6. EE in Municipalities
7. Private Sector Energy Efficiency
8. EE Monitoring System
9. Conclusion

National Energy Efficiency Strategy

- In 2005, a National Energy Efficiency Strategy (NEES) was developed and published to explore the potential for improved energy utilisation through reducing the country's energy intensity.
- The NEES provides a national target of **12% for the overall reduction in energy intensity** by 2015, and also gave aspirational sector energy efficiency improvement targets of 15% for industry and mining, 15% for commercial and public buildings, 15% for residential, 10% for transport, and 9% for power.
- The NEES states the aspirational targets for the respective broad energy-use sectors as a **percentage improvement in energy intensity** to be achieved relative to year **2000 baseline**.

National Energy Efficiency Options

(Options - All Energies)

Energy Conservation	**Energy Efficiency**	Energy Substitution		Re-Generation / Own-Generation
		Renewables	Other, e.g. Fuel Switching	
Clarification of term: Reducing the Consumption of Energy without impacting on Production and/or Safety	Clarification of term: Included here to show how "pure" EE fits with other options available	Clarification of term: Adding renewable or "Green" generation capacity on the demand side of utility supply	Clarification of term: Switching energy consumption to a different energy source SEE NOTES on fuel switching	Generating energy from waste which is fed into the demand side of the utility supply to lessen the use of the utility supply
Example: Turning off lights in unoccupied areas or after hours	Example: Replacing technologies with more efficient alternatives	Example: Installation of Solar PV panels to reduce electricity purchased from Utility	Example: Changing from Electrode boilers to gas-fired boilers or vice versa	Example: Generating electricity from waste-heat or from burning waste material

To reduce the energy intensity of the South African economy through improvements in energy efficiency, target of 12% by 2015

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Specific Energy Efficiency Interventions

- Public & Private EE Campaigns
- Other campaigns including schools etc.
- **Measure impact** of the EE Campaign

- Localize supply of LED technology for street-lighting
- Source supply-install of LED
- HVAC, and other efficient technologies
- **Measure impact relative to baseline**

- Collate database of public buildings
- Measure baseline consumption
- Source supply-install of technologies that reduce consumption
- **Measure impact relative to baseline**

- Source supply of product that is >70% local content.
- Source installation and maintenance
- Standard Offer model for EEDSM technologies
- Standard & Labelling of appliances
- **Measure impact**

- Energy Management Plans
- Energy auditing process
- EE Tax Incentive Scheme
- Standard Offer model for EE technologies
- **Measure impact relative to baseline**

Improve public awareness and increase public participation in EE programme	Increase efficiency (and revenue) of municipal infrastructure	Retrofit HVAC, lighting etc. with new technologies, reduce energy consumption in line with building regulations	Increase penetration in high consumption domestic areas by replacing electric geysers	Decrease energy intensity through various interventions
EE Awareness Campaign	Municipal EEDSM	EE in Public Buildings	EE in Residential areas: SWH/Heat Pump, appliances, etc	Industrial EE Improvement

Policy, Institutional Arrangements, Standards and Regulatory Mechanisms, Energy Consumption Baselines and Monitoring of Targets

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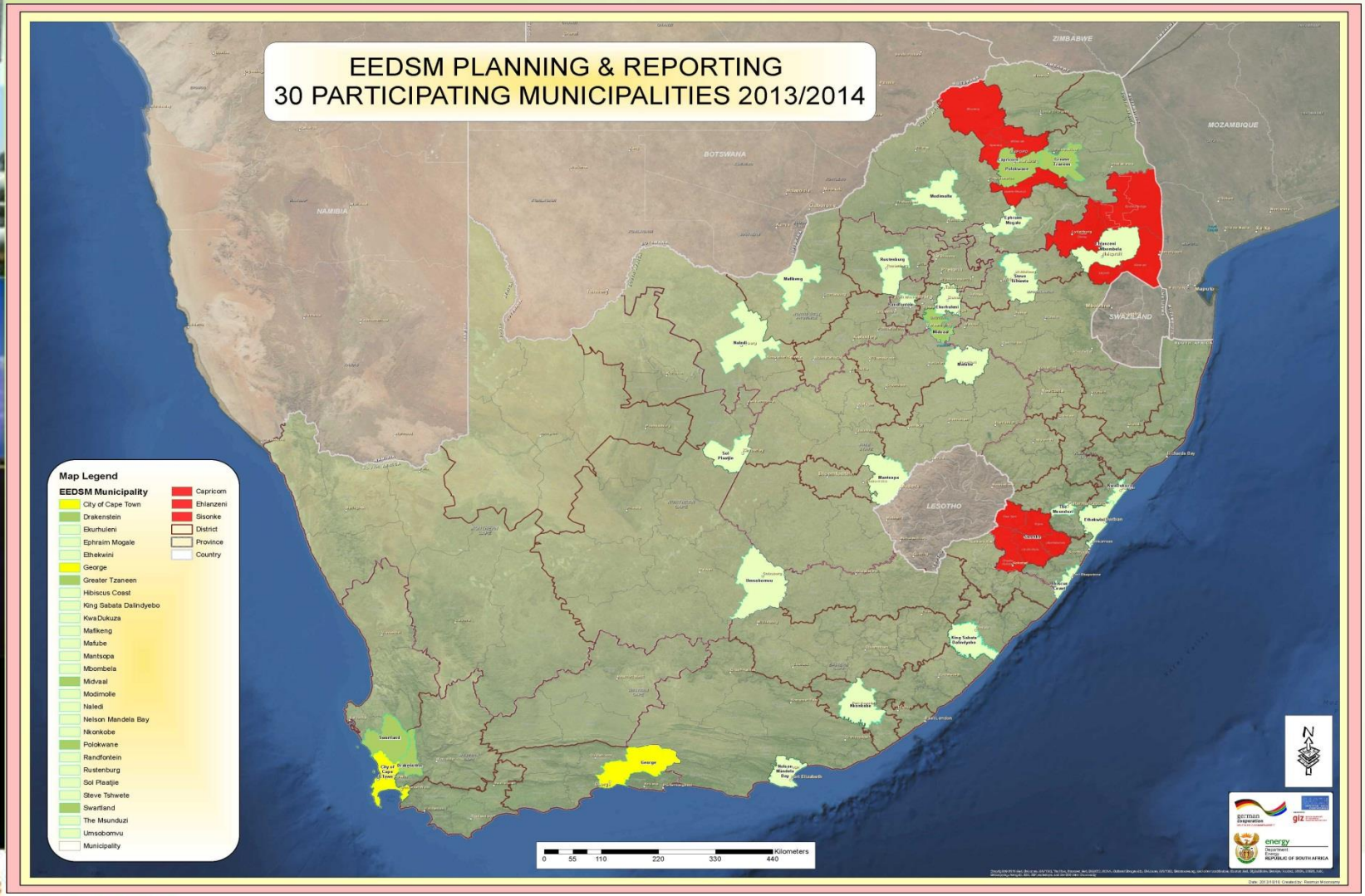
Energy Efficiency in Public Buildings

- In recognition of the **role that energy efficiency plays in national objectives** the Departments of Energy and Public Works decided to work together to **drive continuous improvement of energy efficiency** in public buildings.

- The Departments have decided to focus on:
  (a) developing a **road map/plan** for improved energy efficiency in public buildings supported by an standardized energy management in line with ISO/SANS 50001;
  (b) Developing a government energy efficiency **policy framework** for the introduction of energy performance certification and smart meters in public buildings;
  (c) Setting internal **energy efficiency objectives** appropriate to public building facilities which respond proactively to, and are aligned with appropriate government policies and strategies;
  (d) Developing a system to introduce **Energy Performance Certification** in public building facilities;
  (e) Determining **energy consumption baselines** through the use of smart metering technologies for the development of the energy efficiency target monitoring system

Energy Efficiency in Municipalities



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Energy savings in GWh/a achieved through the EEDSM program of DoE, Pretoria (2009/2010 - 2016/2017)	GWh/a in 2009/2010	GWh/a in 2010/2011	GWh/a in 2011/2012	GWh/a in 2012/2013	GWh/a in 2013/2014	GWh/a in 2014/2015
Energy savings from budget year 2009/2010	22,0	22,0	22,0	22,0	22,0	22,0
Energy savings from budget year 2010/2011		36,0	36,0	36,0	36,0	36,0
Energy savings from budget year 2011/2012			45,6	45,6	45,6	45,6
Energy savings from budget year 2012/2013				39,2	39,2	39,2
Energy savings from budget year 2013/2014					35,8	35,8
Energy savings from budget year 2014/2015						35,0
Energy savings from budget year 2015/2016						
Energy savings from budget year 2016/2017						
Total savings achieved	22,0	58,0	103,6	142,8	178,6	213,6
Total cumulated energy savings achieved since beginning of the EEDSM Programme in 2009/2010	22,0	80,0	183,6	326,4	504,9	**718,5**
Costs in Mio ZAR per GWh for a municipality (1)	0,6246	0,6246	0,6246	0,6246	0,6246	0,6246
Total energy costs saving in Mio ZAR since beginning of the EEDSM Programme	13,7	50,0	114,7	203,8	315,4	448,8

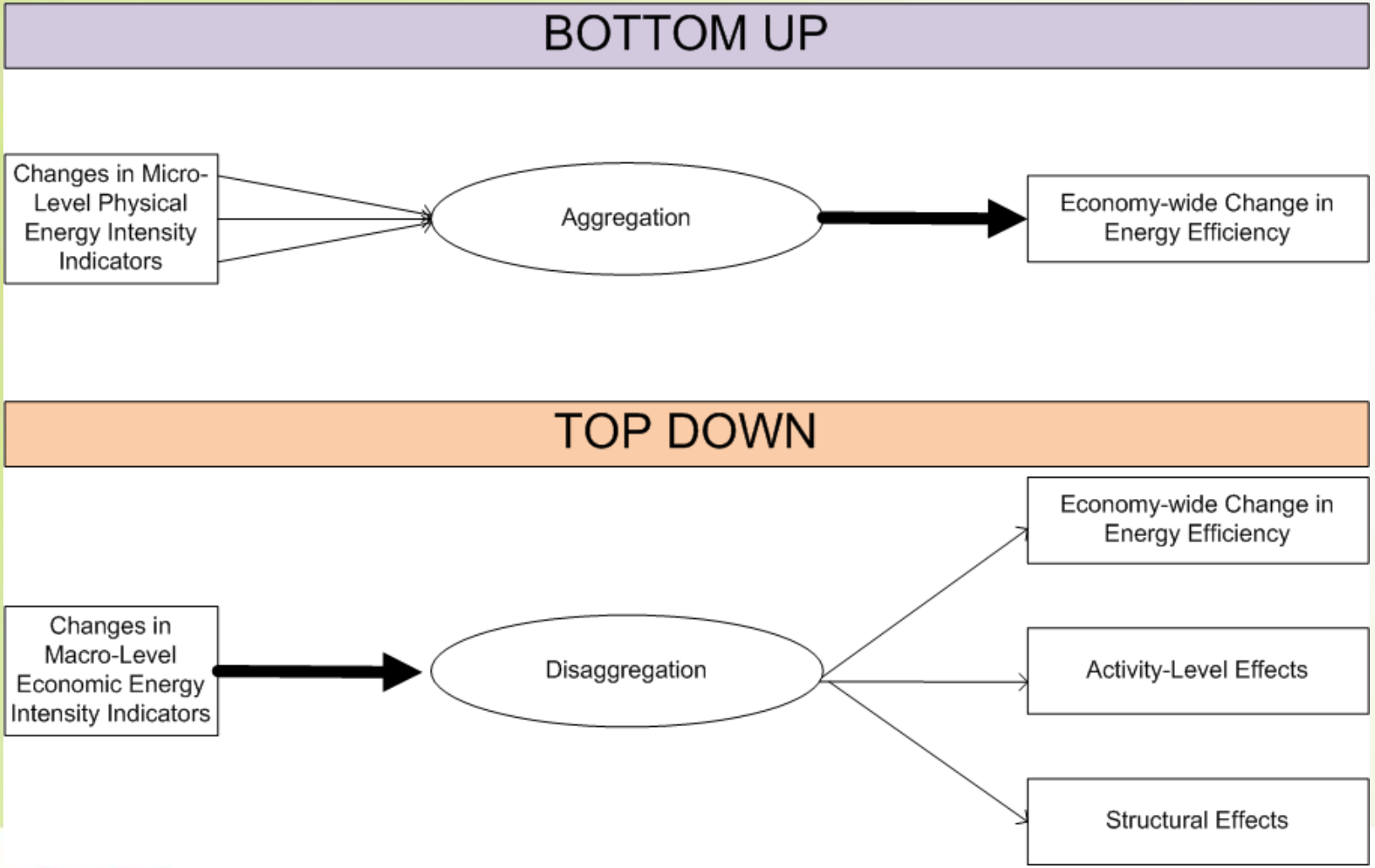
Private/Industrial Sector Energy Efficiency

- Improvement of **energy management and data reporting** using 2012 Regulations on Mandatory Provision of Energy Data as a base.
- **Energy baselines** calculated by a certified energy auditor or measurement and verification professional in accordance with SANS 50010
- Determination of **energy performance indicators** for continuous improvement
- Provision of **incentives** on energy savings and manufacturing
- Monitoring, Reporting & Verification (**MRV**) of the implementation of the energy management plans, and achieved energy savings

Energy Efficiency Monitoring System

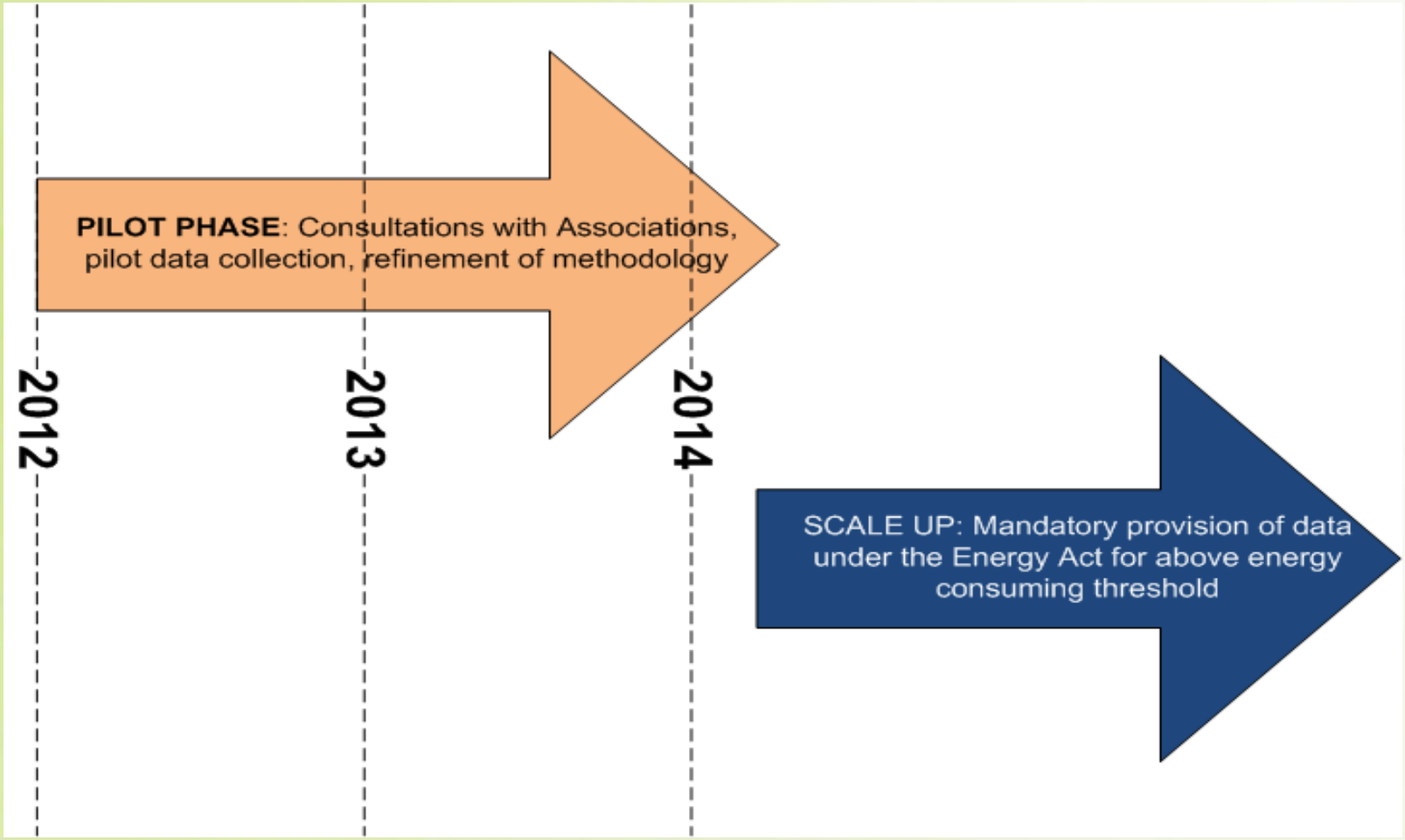
- It should be note that, since 2005, the **monitoring** and **reporting** of energy savings has been limited, and as a result the Department is currently developing the EE Target Monitoring system.
- The analysis being used by the Department is a '**decomposition**' analysis and **uses top-down** calculation methods of energy savings.
- The overall **objectives of the EEMS** are to**:**
  - Institutionalise **energy efficiency monitoring system** and develop energy efficiency management systems within government structures
  - Track the **developing state of energy efficiency** in South Africa using updated energy efficiency indicators
  - Identify drivers for, and responses to energy efficiency changes
  - Monitor progress towards the targets and goals set in the National Energy Efficiency Strategy
  - Inform future energy efficiency measures, policies, financing, regulations and plans

Energy Efficiency Monitoring System -: Bottom Up vs Top Down



Source: IIEC

Status of EE Monitoring System



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CONCLUSION

- Energy efficiency indicators and baseline data will assist **energy management planning** across sectors;
- **Proposed mandatory** provision of energy management plans will enable the **review** of Energy Efficiency Strategy every five years;
- However, it is important for organisations and individual companies to **collect and submit data** required for the EETMS;
- The Energy Efficiency Tax Incentive Scheme is one of the government's attempts to **encourage energy efficiency improvement**. The Incentive Scheme provides an opportunity to **accelerate implementation** of energy efficiency interventions.
- The **EETMS** has **establish a base** for the development of the post-2015 EE Targets and Action Plan

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