

WEC AFRICA WORKSHOP ON ENERGY EFFICIENCY

“Energy Efficiency: What are the Priorities, the proper Policy Measures and the best Practices for Africa?”

29 – 30 June 2009
Addis Ababa, Ethiopia

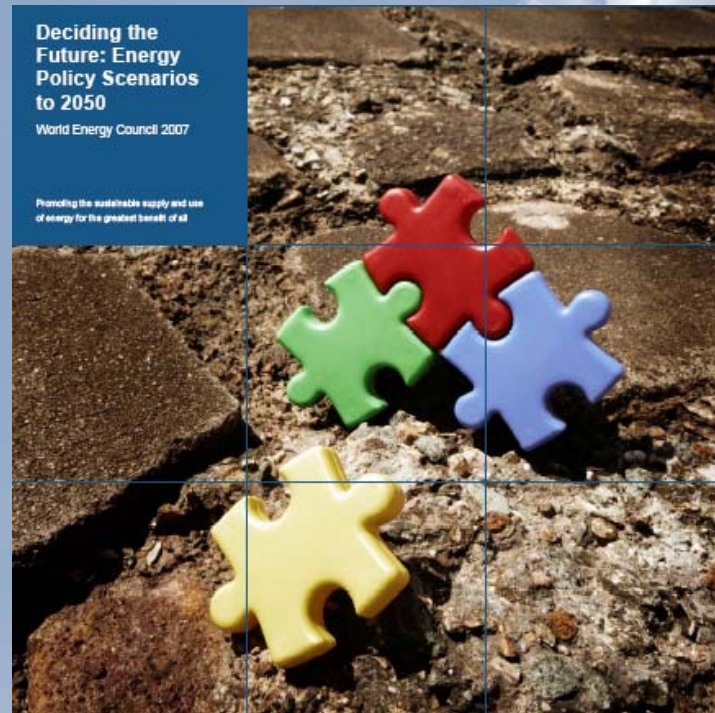
Role of Energy
Efficiency in the WEC
Scenarios for Africa

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Description of WEC Energy Policy Scenarios





Energy Policy : Framework, Dimensions and Metrics

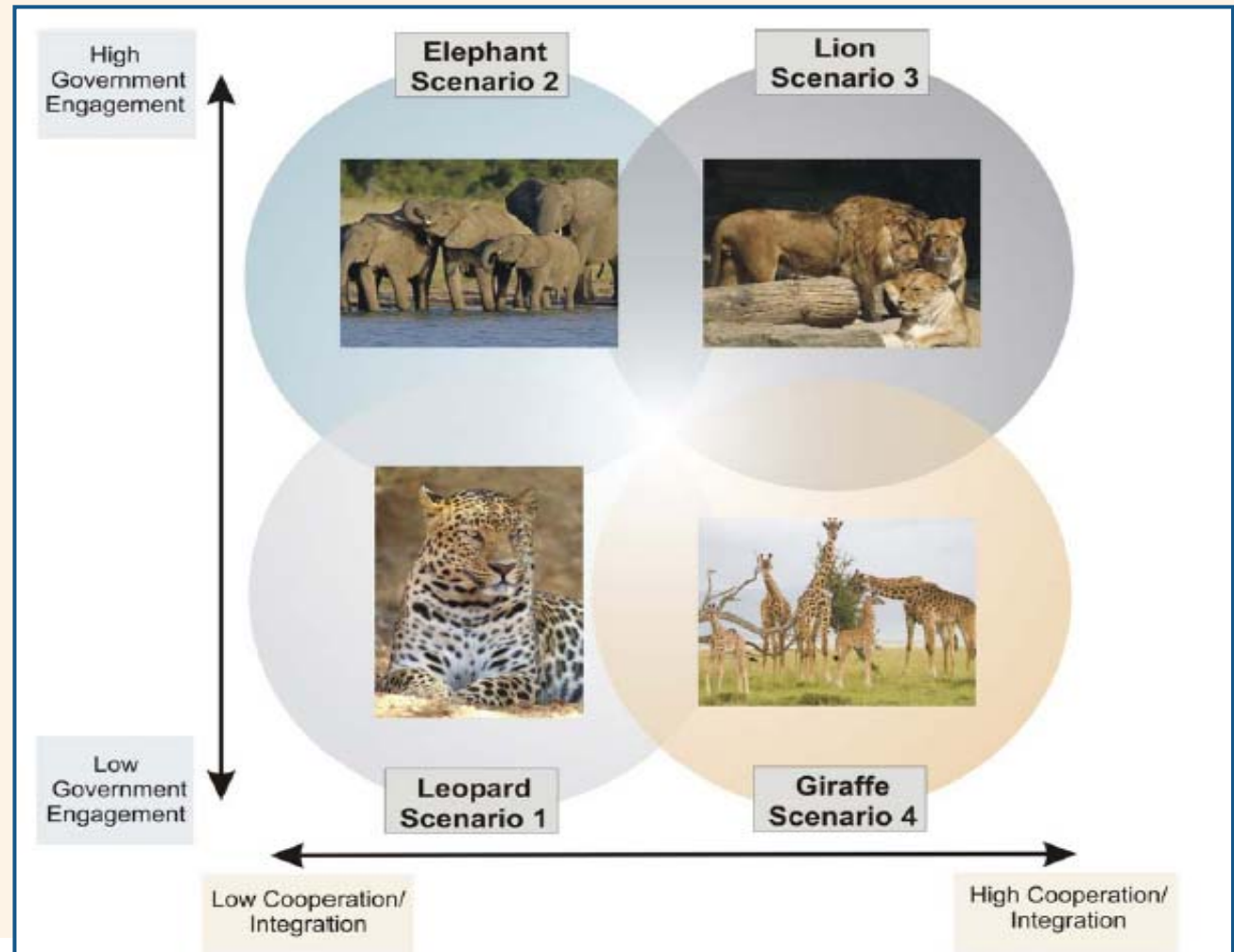
- WEC studied Energy Policy Scenarios, within the framework of the two following axis:
 - . Government Engagement (Low – High)
 - . Cooperation & Integration (Low - High)
- Combining these in four dimensions (Scenarios) proved to be of real importance and interest, in terms of addressing the challenge of delivering a Sustainable Energy Future (i.e. addressing the three WEC Millennium Goals, 3As)
- Subsequently, a number of energy sector metrics assisted in understanding the long-term energy landscape.

The four Energy Policy Scenarios

X- Axis: Cooperation and Integration (Low - High)

Y- Axis: Government Engagement (Low - High)

- The names of the these animals have been utilized because their characters match pretty-well the main features of the related Scenarios (see WEC film).



Scenario 1: Leopard (Low Government – Low Cooperation)

- Government engagement and international & regional cooperation / integration are limited.
- Domestic economic development is the primary driver, underpinned by domestic energy security.
- There are few levies or subsidies.
- International treaties, where they exist, are ineffective.
- Transfer of technology and know-how is relatively constrained.



Scenario 2: Elephant (High Government – Low Cooperation)

- The first priority is domestic energy security to support structured economic activity and growth.
- Focus on development, and protection, of indigenous resources.
- The inward focus approach to development has a negative impact on economic growth, and accordingly, brings the energy system to resort on older and less efficient technologies, as transfer of technology and know-how is relatively constrained.



Scenario 3: Lion (High Government – High Cooperation)

- The economy experiences a high growth rate, due to the combination of strong government engagement and high level of cooperation / integration.
- Increasing access to modern energy and introduction of efficient and effective technologies boost energy use.
- There is a stimulus to develop technologies appropriate to the needs of developing markets
- Funding such developments, as well as the deployment and implementation of successful technology needs are being made possible, thanks to proactive & cooperative energy policies, bilateral and regional inter-government agreements, and specific fiscal incentives.



Scenario 4 : Giraffe (Low Government – High Cooperation)

- Primary focus is economic growth, freeing up global markets to promote international trade.
- Heavy reliance on market mechanisms with limited regulation.
- International market opportunities stimulate energy technology development and deployment - and market-driven interchange leads to rapid transfer of technology and experiences & best practices sharing.



Evaluation of the Scenarios

We evaluated each of the scenarios on the basis of positive and negative implications for the achievement of the three WEC Millennium Goals.

WEC Millennium Goals

Accessibility: access to affordable modern energy for all people

Availability: reliable and secure energy supply

Acceptability: protect and preserve the local and global environment

In particular, we also assessed how EE improvements are impacted by the Scenarios.

Key Indicators for the Scenarios

The following key indicators have been applied for the 4 policy scenarios to assess how proactive Energy Policies can meet the challenges of the physical, social and economic World and achieve the 3As :

GDP growth

Demographic growth

Energy intensity

Primary energy mix

Total primary energy required (TPER)

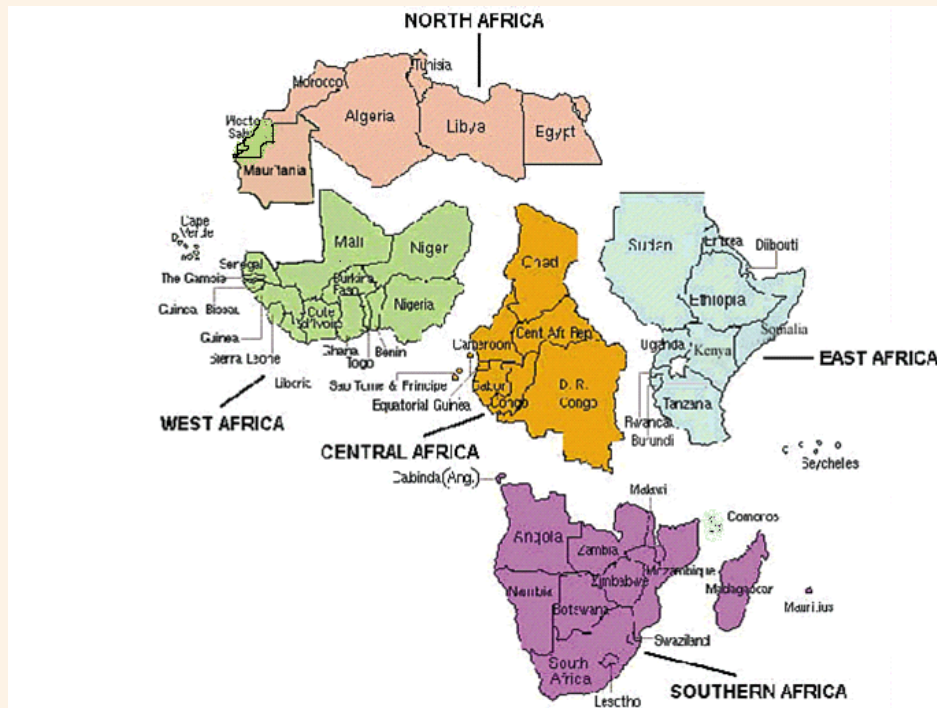
Greenhouse gas emissions

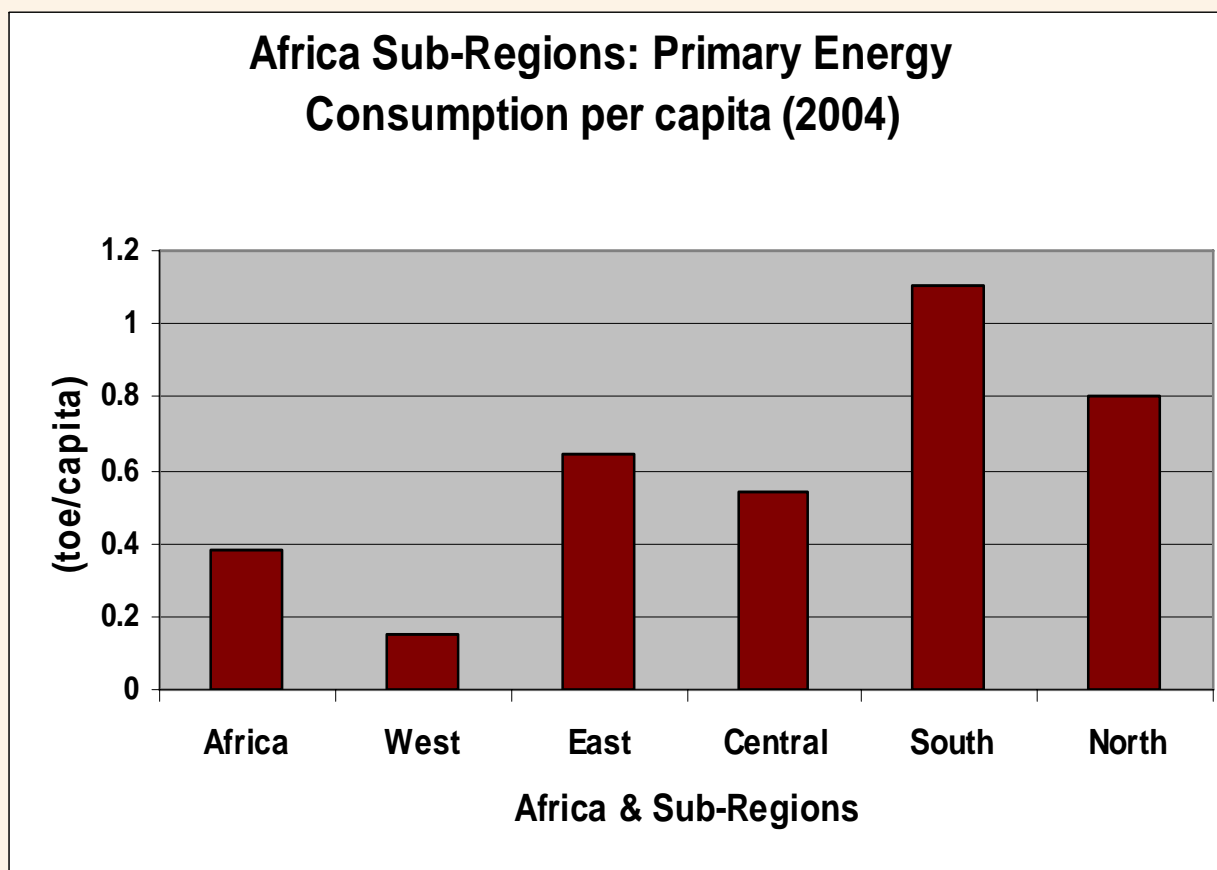
Supply-demand tensions (the balance between the two): Oil, Gas, Coal, Nuclear power, Renewable energy, non-commercial or traditional energy.

They form a backdrop for the policy scenarios.

Africa Study

5 Sub-Regions

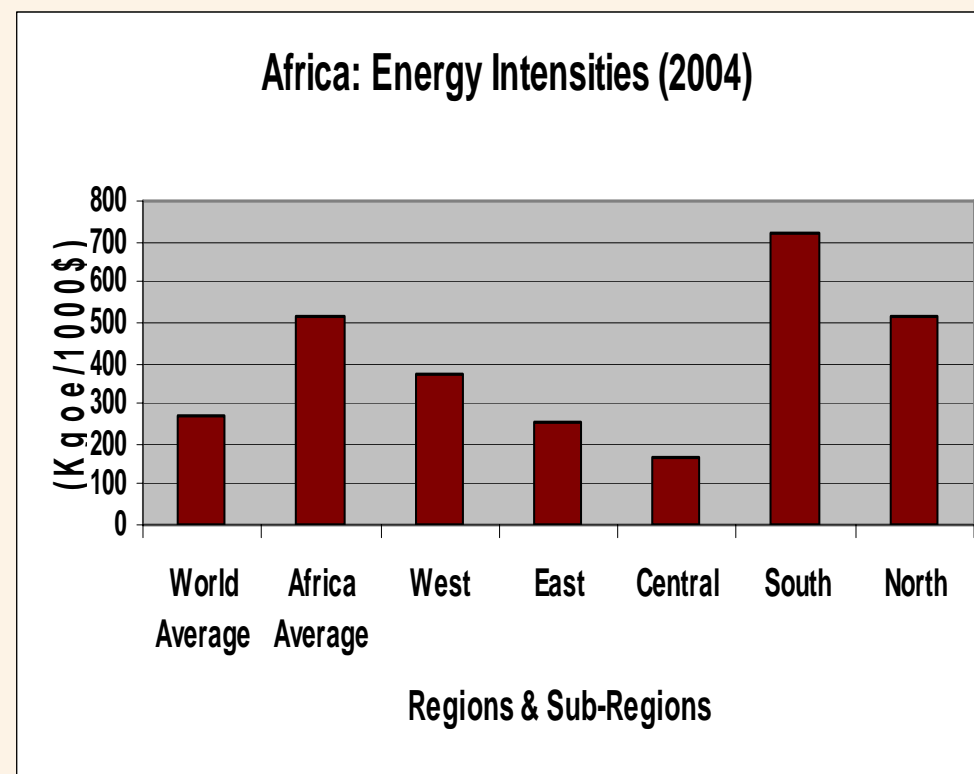




Source: WEC Scenarios Africa report, 2007

Main findings and obstacles to EE improvements

- In the past decade, EE improvement objectives, for industry, transportation and residential sectors have not been realized for most African sub-regions and countries.
- In 2004, Africa showed a quite high Energy Intensity, about the double of the World average. (Graph)
- Energy Intensity varies widely between sub-regions – Central Africa having the lowest and Southern Africa the highest.



Source: WEC Scenarios Africa report, 2007

Main findings and obstacles to EE improvements (cont.)

The main reasons for the inefficient performance are attributed to:

- Passive attitude of Governments of most countries in setting up and fostering national energy efficiency and conservation programmes
- Lack of appropriate policy measures, including proper incentives for substantial EE improvements
- Low public awareness concerning the benefits of implementing EE measures
- Lack of adequate technology transfer and access to appropriate energy-efficient technologies
- Insufficient local industrial capabilities and related capacity building that could facilitate the implementation of EE&C measures and actions
- Low private sector involvement in EE initiatives
- Unsustainable energy tariffs for some countries.

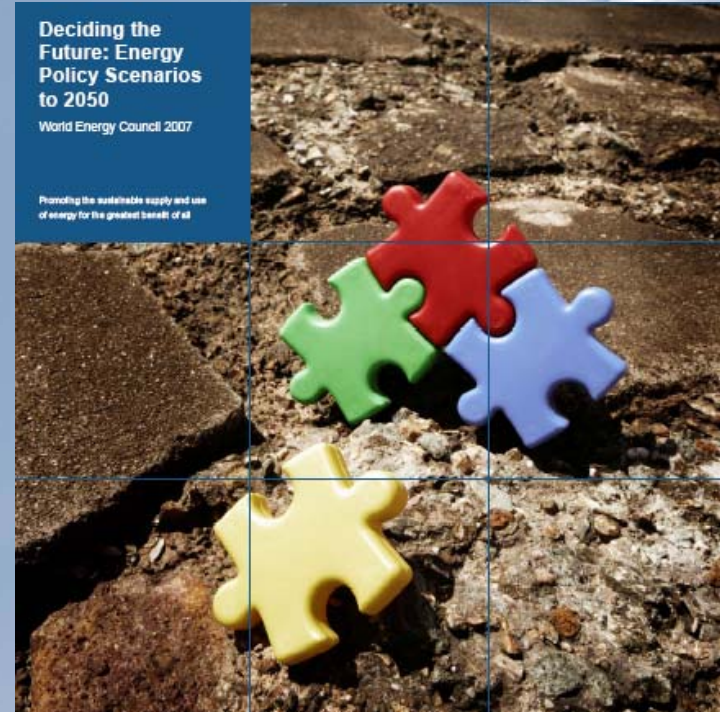


Trends in Energy Efficiency and Achievement of the 3As

Deciding the Future: Energy Policy Scenarios to 2050

World Energy Council 2007

Promoting the sustainable supply and use of energy for the greatest benefit of all



Energy Intensity

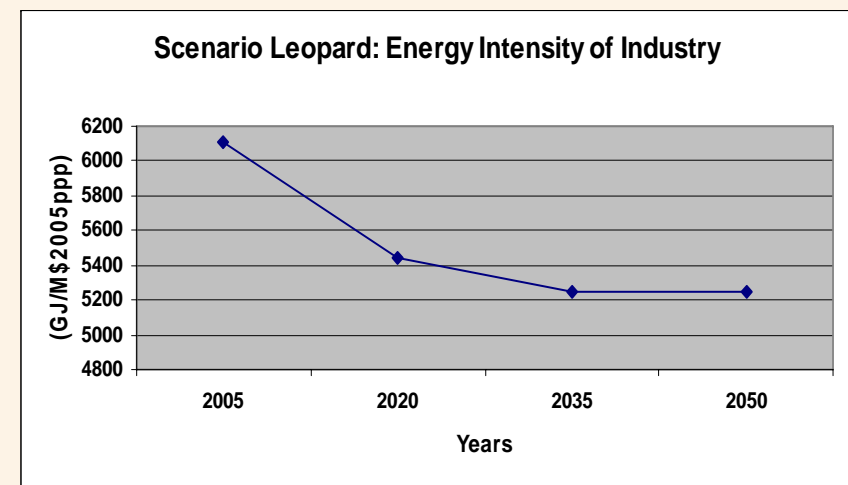
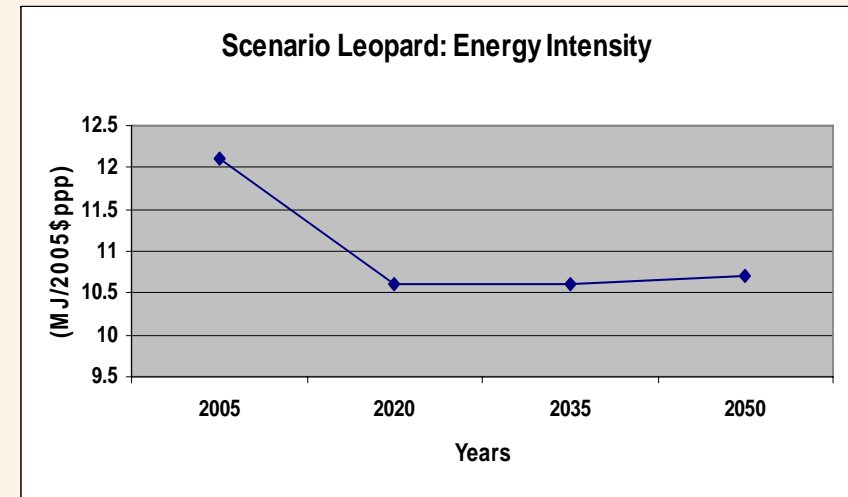
Leopard Scenario: Low Government – Low Cooperation



- After the initial period where continuing present efforts can bring some improvements, Energy Intensity is then increasing in all other periods, because: the technologies employed so far are deteriorating, there is less productive use of energy and more intensive use of older and less energy-efficient equipment (vehicles, household appliances, etc.) (Graph)

- Limited cooperation with the industrialized countries constraints transfer of technology and know-how, as well as, foreign investment flows and access to modern energy – all these impact the nations capacity for promoting EE&C programmes on a large scale.

- EE remains low, both on the supply side and more so on the consumption side.

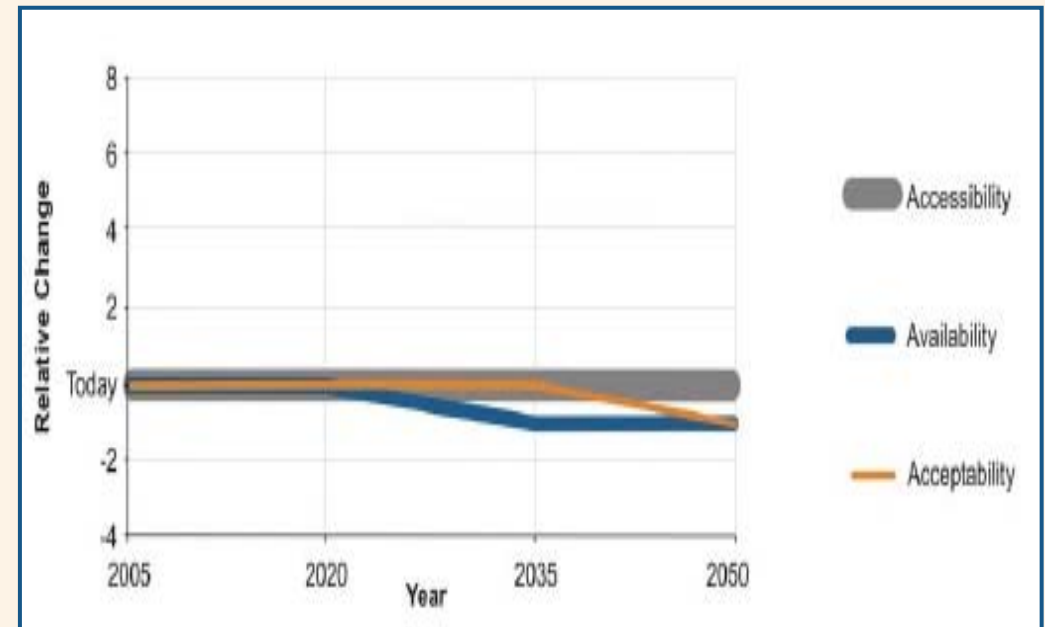


Source: WEC, Scenarios – ENERDATA: Model Poles

Promoting the sustainable supply and use of energy for the greatest benefit of all

Leopard scenario: 3As relative change

- Improving access to affordable and reliable energy remains difficult, demand for non-commercial energy increases and poverty worsens.
- There is no progress on any of the measures (3As) under this scenario. (Graph)
- For the developing regions, this scenario leads to social and environmental degradation.

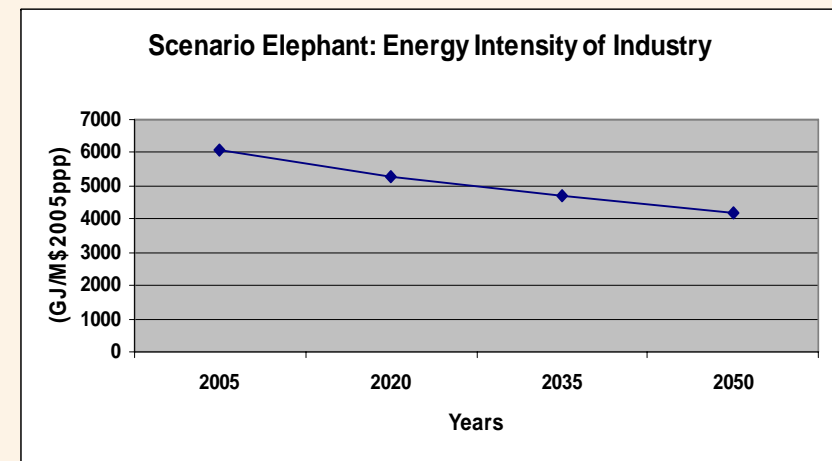
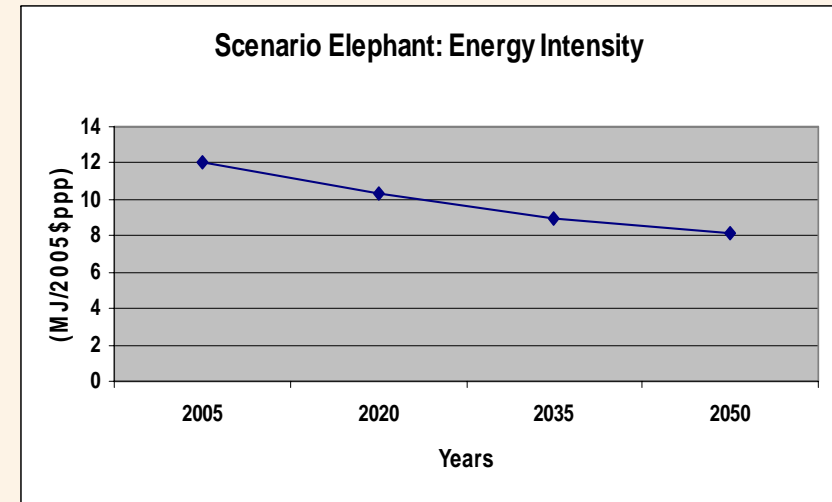


Energy Intensity

Elephant Scenario: High Government – Low Cooperation

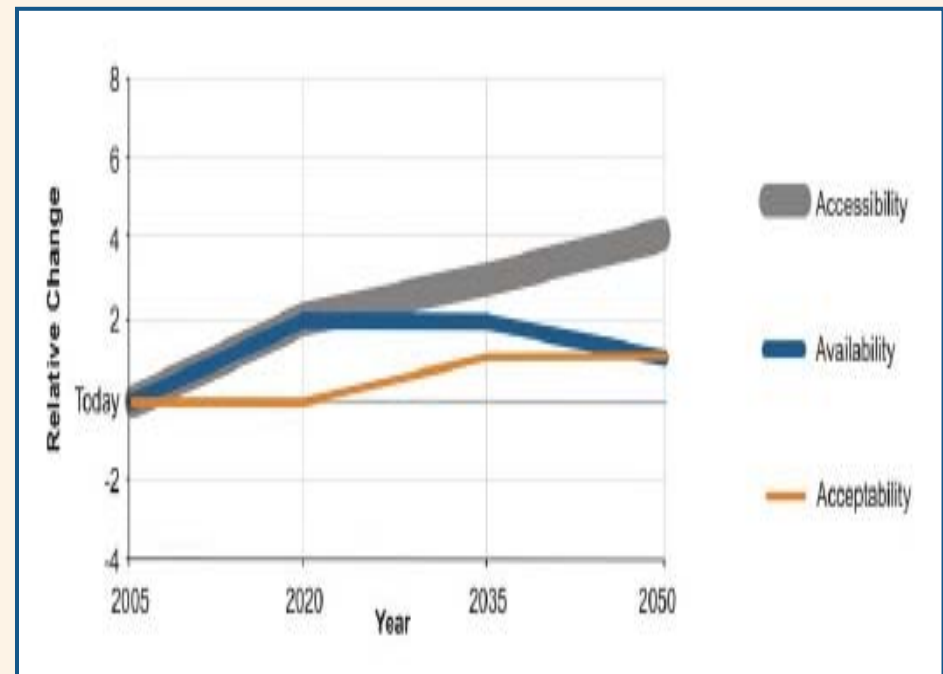


- Governments are willing to promote EE policy measures to ensure the sufficiency of the domestic energy resources - these efforts contribute to stabilize the increase of Energy Intensity or even decrease it slowly. (Graph)
- Low cooperation conditions results on preventing expanding the availability of domestic energy resources, as well as access to, and deployment of, energy-efficient technologies.
- Accordingly, Governments manage to contain possible increase of Energy Intensity during the last period 2035 – 2050, by stimulating innovation.



Elephant scenario: 3As relative change

- Africa sees the benefits of more positive economic results than Scenario 1 - but cannot sustain its gains over time, due to lack of access to new technologies because of limitation of financial resources and constrained technology transfer.
- Government engagement ensures steady improvement in all the measures (3As), mostly in the beginning of the period. (Graph)
- But, at the end of the period, things get worse, because low cooperation inhibits progress and constraints technology and development capabilities.

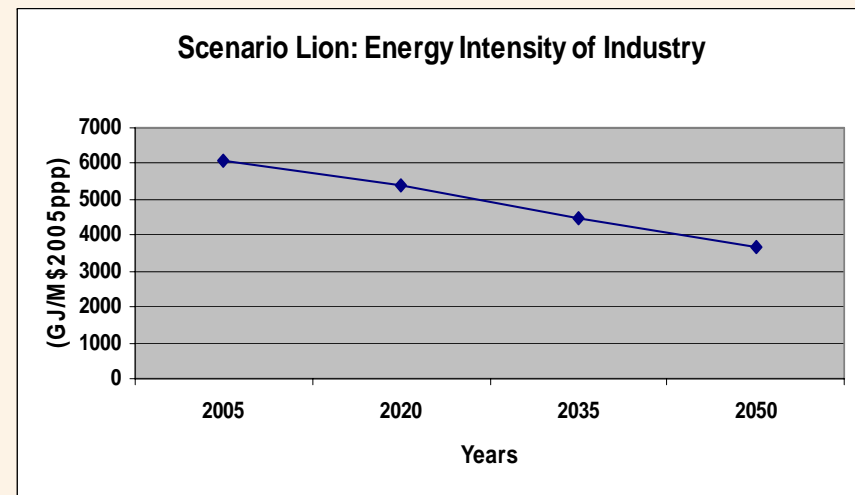
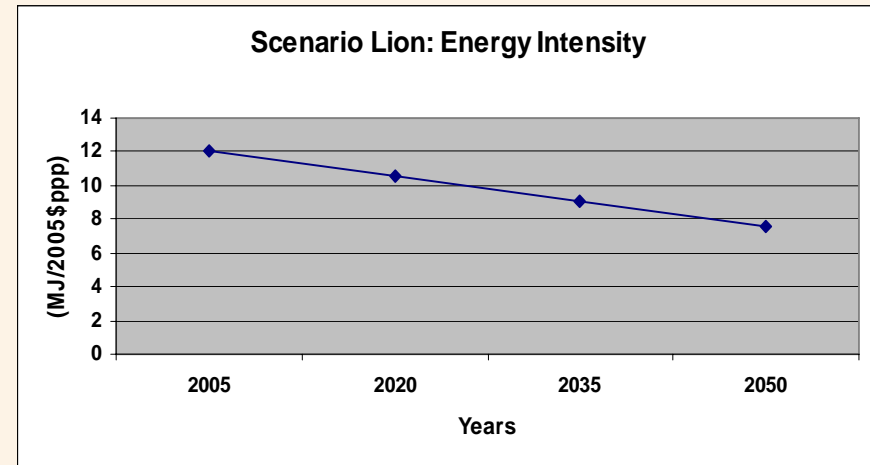


Energy Intensity

Lion Scenario: High Government – High Cooperation



- EE improvements take place during all the period reducing Energy Intensity, because of the following actions: establishment of incentives by Gov. to stimulate EE investments, large scale of EE programmes initiated and supported by Gov., promotion of more energy-efficient technologies, restriction of old used imported vehicles and appliances, use of biofuels in the road transportation, etc. (Graph)
- These actions are indeed facilitated by high Gov. engagement and technology deployment & transfer through cooperation initiatives.
- Africa adopts the latest technologies.

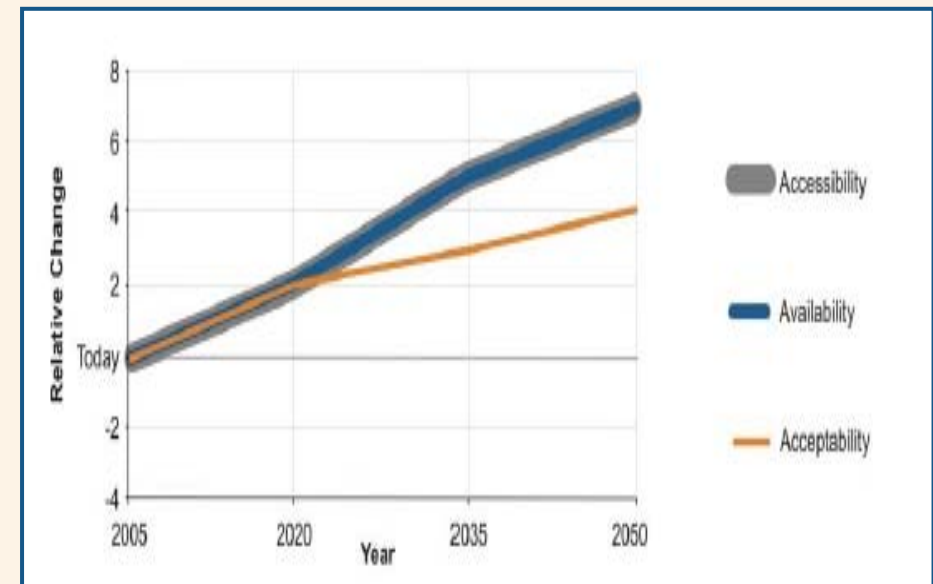


Source: WEC, Scenarios – ENERDATA: Model Poles

Promoting the sustainable supply and use of energy for the greatest benefit of all

Lion Scenario: 3As relative change

- Better growth rates and higher cooperation encourage more financing of energy projects – in addition, strong economic growth leads to higher per capita GDP and improvement of living standards.
- Access to modern energy is significantly increased and modern / improved biomass is available for rural households.
- All 3A's make strong progress through powerful international agreements and programmes. (Graph)
- The developing regions make progress on a sustainable basis.

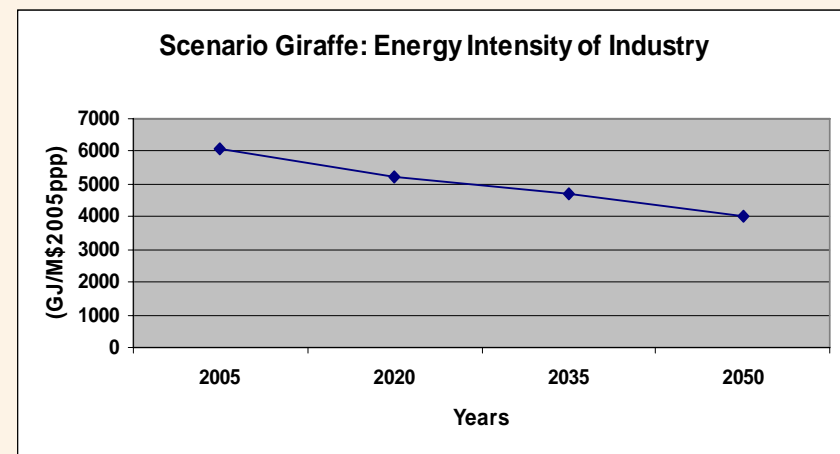
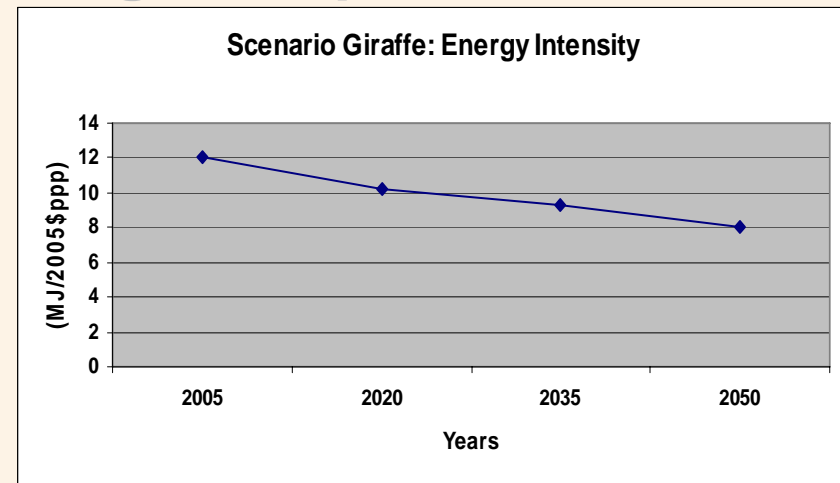




Energy Intensity

Giraffe Scenario: Low Government – High Cooperation

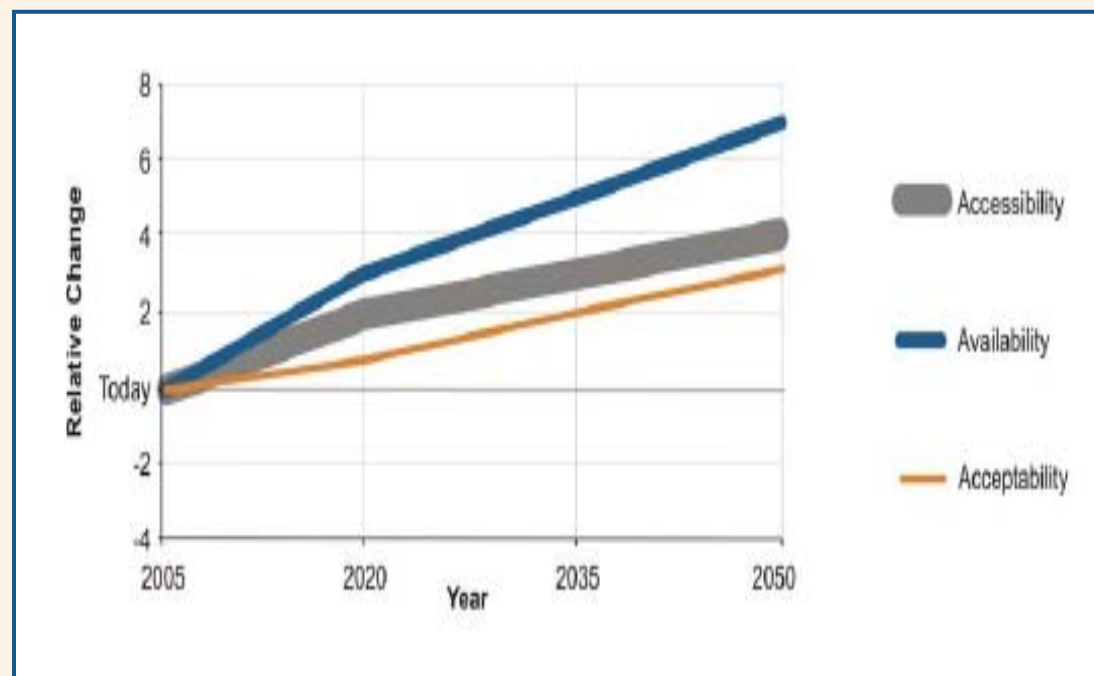
- The Energy Intensity declines, because of the following factors: high transfer of technologies and know-how, higher energy prices, introduction of biofuels in road transportation, limitation of imported inefficient equipments, strong involvement of the private sector, etc. (Graph)
- Energy efficiency and conservation improves, due to higher transfer of know-how and technology.



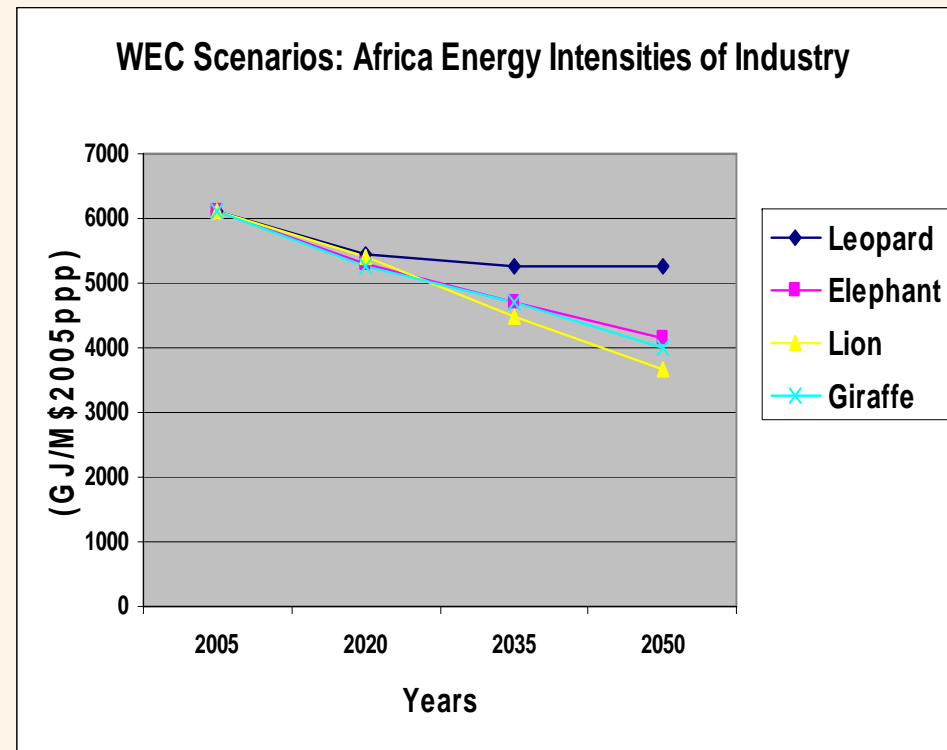
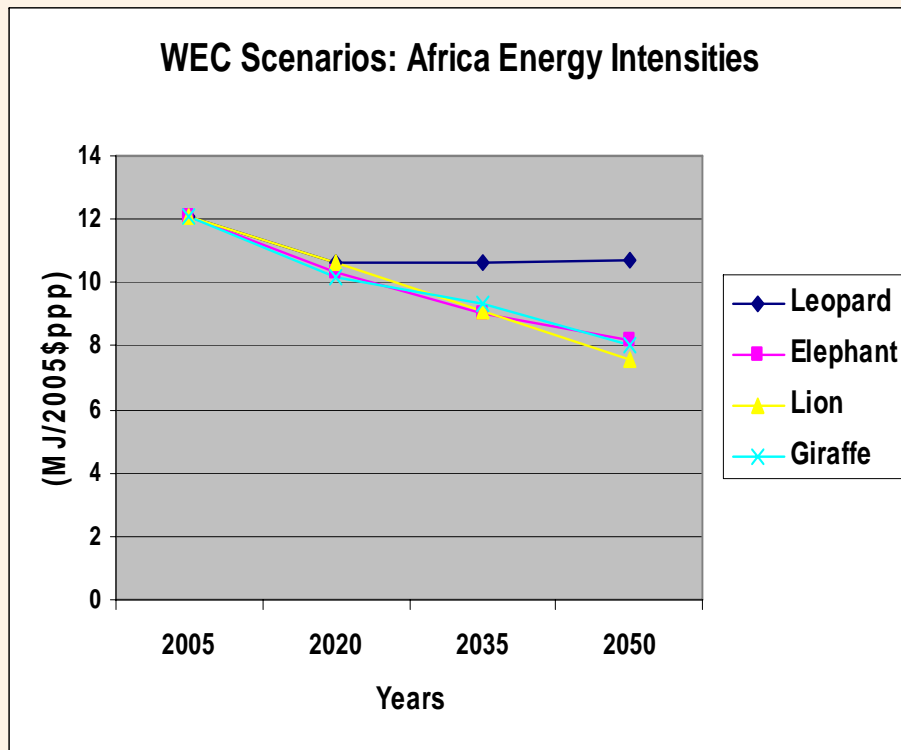
Source: WEC, Scenarios – ENERDATA: Model Poles

Giraffe scenario: 3As relative change

- Due to strong involvement of the private sector internationally and continent-wide and liberalization and globalization, innovation in energy technology is enhanced, reducing technology costs and boosting access to modern energy.
- Availability improves dramatically as an essential enabler of economic growth. (Graph)
- Accessibility and Acceptability are second order priorities in the absence of adequate government engagement. (Graph)
- Africa and DCs also progress, due to high cooperation.

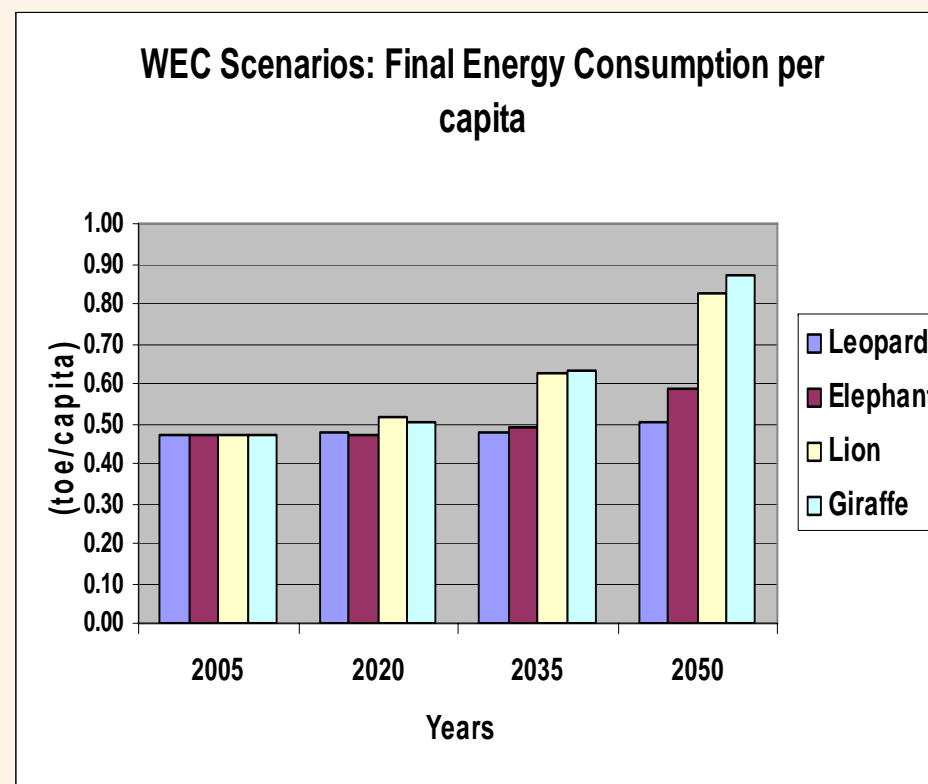
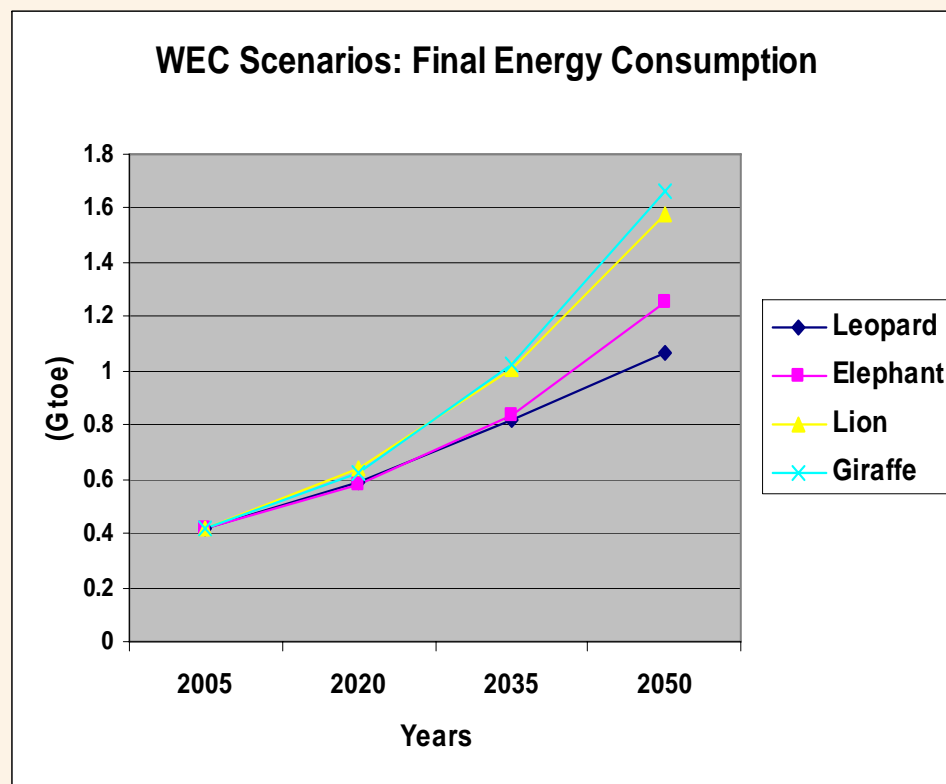


Synthesis of Scenarios trends - Comparative results



Source: WEC, Scenarios – ENERDATA: Model Poles

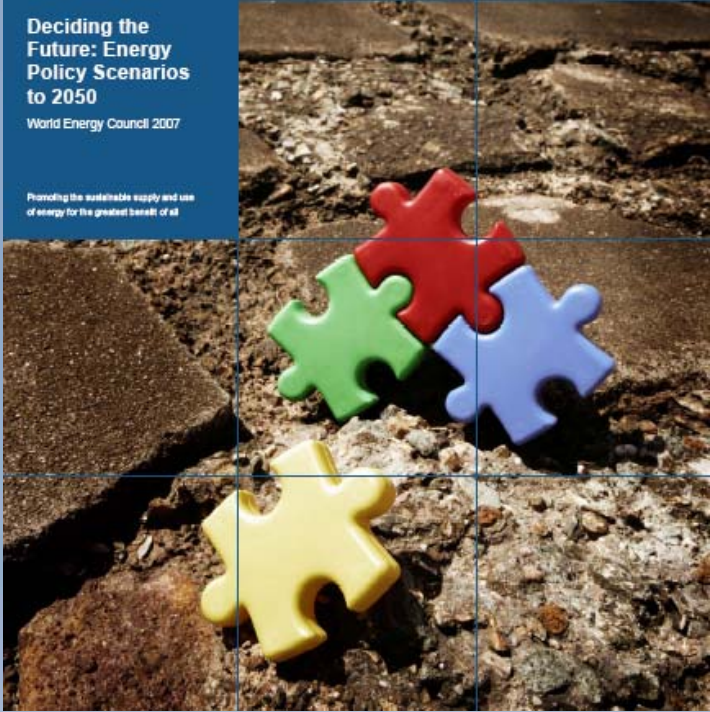
Synthesis of Scenarios trends - Comparative results (cont.)



Source: WEC, Scenarios – ENERDATA: Model Poles, 2007



Features of Lion Scenario



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Prominence of the Lion Scenario for Africa

- Amongst the four possible Scenarios it appears that the **Lion scenario** is the best one for DCs, Africa, and even for most developed countries - and also, the best strategy for achieving the WEC's 3As and for improving EE.
- High government engagement has never been empathized more than today's world financial & economic crisis. In addition, High regional and international cooperation / integration would certainly being a critical policy objective of the AU and the African leaders.
- All these underpin the suitability of the **Lion Scenario** for the African Nations.



Shaping the Sustainable Energy Future of Africa, through the “Lion Scenario”

□ For DCs:

✓ **High Government** in the required areas (mostly in establishing right energy policies and setting up appropriate regulations and rules of trade, etc.) will help develop sustainable energy systems, and

✓ **Greater cooperation & integration**, including increased partnerships with the private sector and industrialized countries, will offer the best route to achieving WEC's 3As

□ And particularly, for Africa:

✓ **High Government Engagement and robust regional and international cooperation & integration** are necessary to: 1/foster technology transfer and deployment of cleaner and more efficient technologies, 2/ speed up and scale up energy accessibility and eradicate energy poverty.



Policy Recommendations for Africa Region



Policy recommendations for Africa region

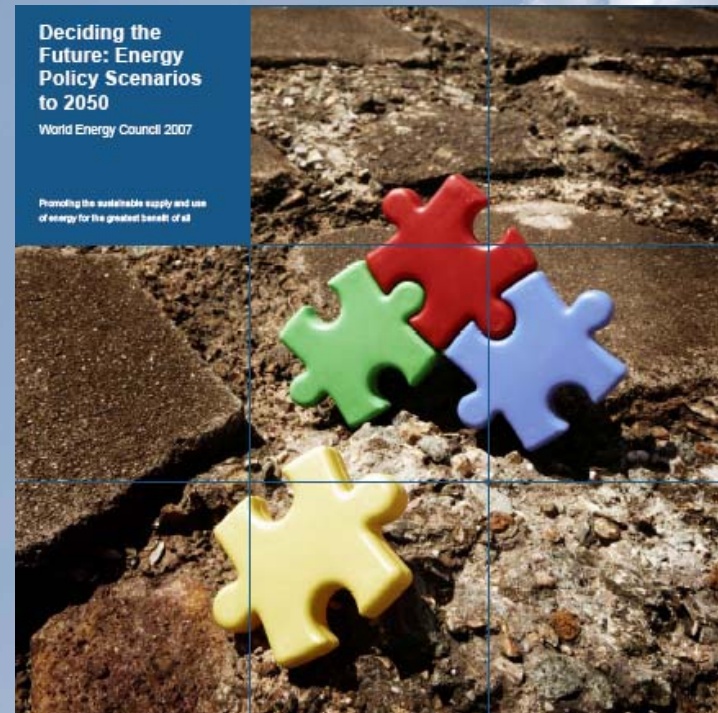
There is a need of appropriate policy mitigation options to sustain the Scenarios and to pave the way for concrete actions towards the achievement of the 3As, and in particular, towards EE improvements. These are:

- Improving economic performance through good governance, raising productivity, and enhancing development of capabilities (human, infrastructure, etc.)
- Developing local & regional industries for manufacturing electrical equipment adapted to the countries' energy needs, as well as companies providing required energy services
- Creating an attractive investment climate and a favourable business environment that encourages private and foreign finance through multilateral institutions and investments funds, as well as through domestic financial markets
- Improving the conditions for attracting private investments in the energy sector, in particular through actions to reduce investment risks, including sound institutions and appropriate policies & regulations. These will allow for the development of energy infrastructure and facilities
 - Encouraging innovative solutions for EE improvements in all the energy value chain, through national & regional programmes (supported by legislation), starting with simple initiatives, such as lifestyle changes (e.g. switching-off light in unoccupied spaces, driving less to save energy) and elimination of importation of old and inefficient cars. A key element is raising awareness as accompanying measure.

Policy recommendations for Africa Region (Cont.)

- . Providing stimuli for the development of the energy sector within neighboring countries and inside the countries' sub-regions, through power pools, cross-border pipelines, etc.
- . Supporting energy technology innovation and a wider and accelerated deployment & dissemination of sustainable and proven energy technologies by incentives, so that technologies can penetrate at a faster rate. These may include feed-in type arrangements, but must be backed by appropriate regulations, legislations and institutions
- . Building human capacity in sustainable energy, and particularly, organizing energy education and training seminars to inject entrepreneurial & technical skills to relevant stakeholders, including youth and women
- . Ensuring appropriate market reform, resulting in: more involvement of the private sector, more efficient energy companies, pricing energy efficiently and phasing out subsidies for conventional energy supply and use.

Conclusions



Conclusions

- The global financial & economic crisis foregrounds Governments engagement and their indispensable and wholesome involvement in developing economic & social policies and related actions. This is particularly true for Africa, where economic & social development progress are much needed to foster the sustainable development of the Continent.
- In the field of Energy Efficiency, Governments have a prominent role to play in:
 - ✓ Adopting and implementing EE&C policy measures
 - ✓ Establishing proper regulations and right EE institutions
 - ✓ Passing the laws permitting the selection of the most energy-efficient products & equipment
 - ✓ Putting in place the required incentives to stimulate EE investments
 - ✓ Tapping the EE potential
 - ✓ Investing in EE projects & programmes.

Conclusions (cont.)

- Amongst the policy measures, priority focus should be placed on the following: proper incentives, technology improvements (to further lower costs and raise efficiencies), regulation of specific measures, awareness & behaviour changes. These are indeed the most obvious ways to boost energy savings
- In a more general way, focusing on sustainable energy policies for Africa should translate to: 1/ giving higher priority to access to modern energy services, particularly for the poor, 2/ promoting investments in cleaner energy technologies including RE, 3/ promoting EE improvements in all the energy chain, and, 4/ restructuring the energy sector in order to mobilize adequate financing, including from the private sector and the local capital markets
- It is non-less important for Governments to speed up, foster, and strengthen sub-regional & regional cooperation / integration, as a critical way for the sustainable development on the entire African Continent.

Thank You

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