Supporting document

This supporting document presents the sketches of the modules of SAGEM, starting from the next page.
1. Water quantity provision with WfW module sketch
2. Potential electricity generation from invasive module sketch
3. Land module sketch
4. Water supply module sketch
5. Water demand electricity generation module sketch

- Water use coal per kWh
- Water use nuclear per kWh
- Water use pumped storage per kWh
- Water use wind per kWh
- Water use solar per kWh

- Convert GWh/kWh
- Convert GWh/kWh
- Convert GWh/kWh
- Convert litre to kg

- Effective electricity generation from coal in GWh
- Nuclear electricity generation
- Hydropower generation
- Pumped storage electricity generation
- Wind electricity generation in GWh
- Solar electricity generation in GWh

- Total water requirement in electricity generation
- Initial water use from electricity generation
- Relative water use from electricity generation
- Total water requirement in electricity generation in kg
- Convert litre to kg
6. Coal electricity module sketch
7. Nuclear electricity module sketch

- Initial nuclear installed capacity
- Nuclear plant construction time
- Nuclear capacity from green investment
- Nuclear cost in ZAR per MW
- Nuclear capital cost
- Nuclear capacity utilization factor table
- Nuclear electricity generation
- Decommissioned nuclear capacity
- Nuclear plant depreciation rate
- Nuclear green investment
- Future nuclear energy investment
- Planned nuclear development IRP 2010 new built
- <Time>
- <Exchange rate>

Nuclear electricity module sketch.
8. Hydroelectricity module sketch

Hydropower construction 

<Time>

Hydropower capacity

Hydro power depreciation

Average hydropower life span

<Time>

Decommissioned hydropower capacity

Initial hydropower installed capacity

Conversion factor hydropower

Conversion factor table hydropower

<Time>

Hydropower construction table

Hydropower generation
9. Pumped storage electricity module sketch
10. : Solar electricity module sketch
11. Wind electricity module sketch
12. Electricity generation technology share module sketch

[Diagram showing the relationships between different electricity generation sources, including:
- Total electricity demand
- Electricity net exports
- Domestically produced electricity
- Total electricity generation
- Electricity loses
- Required total electricity generation
- Share of nuclear power
- Share of hydropower
- Share of renewable power
- Share of wind power
- Share of solar power
- Share of biomass
- Share of pumped storage power
- Total renewable electricity and hydropower generation
- Renewable electricity generation gap
- Desired electricity generation from renewables]
13. Electricity price module sketch
14. Electricity demand module sketch
15. Oil demand module sketch

- GDP oil demand parameter industry
- GDP oil demand parameter non-energy
- GDP oil demand parameter agriculture
- Elasticity of oil price on agriculture demand
- Elasticity of oil price on industry demand
- Elasticity of oil price on commerce demand
- Elasticity of oil price on residential oil use
- Oil demand intensity non-specified
- Real GDP
- Relative average oil price
- Total oil demand
- Transport oil use
- Mining and quarrying oil use
- Commerce oil use
- Residential oil use
- GDP oil demand parameter commerce
- GDP oil demand parameter residential
16. Gas demand module sketch
17. : Air emissions module sketch
18. : Minerals module sketch (a)
20. Population module sketch

- Population
  - Births
  - Deaths
  - Initial population
  - Death rate
  - Sexually active female
  - Proportion of female babies
  - Age-specific fertility distribution table
  - Natural fertility
  - Total fertility rate
  - Total births
  - Total deaths
  - Total population
  - Time for income changes to affect life expectancy
  - Perceived income per capita ppp
  - Official exchange rate
  - Local conditions adjustment factor
  - Time for income changes to affect life expectancy
  - MFLE difference
  - Normal life expectancy table
  - Life expectancy
  - Initial life expectancy
  - Relative life expectancy
  - Adult population
  - School age population
  - Population growth
  - Population cohort shift
  - Total migration
  - Net migration
  - Crude migration rate table
  - Life expectancy table
  - Perceived income per capita ppp
  - Initial desired fertility rate
  - Desired fertility rate
  - Total births
  - Total deaths
  - Total population
  - Contraceptive prevalence
  - Effect of education on proportion using contraceptive table
  - Average adult literacy rate
  - <Average adult literacy rate>
  - <Relative PC real disposable income>
  - <Relative PC real disposable income>
  - Effect of economic conditions on desired number of children table
  - Age-specific fertility distribution
  - Proportion of female babies
  - Sexually active female
  - Total sexually active female
  - Initial desired fertility rate
  - Desired fertility rate
  - Total births
  - Total deaths
  - Total population
  - Contraceptive prevalence
  - Effect of education on proportion using contraceptive table
  - Average adult literacy rate
  - <Relative PC real disposable income>
  - Effect of economic conditions on desired number of children table
21. Education module sketch
22. : Health module sketch
23. Access to road module sketch
26. Power sector employment module sketch

Diagram showing the employment and employment factors for different power sectors, including:
- Solar power
- Hydropower
- Wind power
- Coal power
- Nuclear power

Employment factors are shown for construction, operation, and manufacturing, with imports indicated as 10%.

Total renewable electricity and hydropower generation is also shown, with renewable energy average job intensity.

Effective electricity generation from coal is also illustrated.
Agriculture module sketch

- **Per capita cereal production**: Yield of crops production in tons.
- **Labor elasticity on yield**: Effect of labor on productivity agriculture.
- **Elasticity of productivity to infrastructure density agriculture**: Effect of infrastructure density on productivity agriculture.
- **Elasticity of productivity to education agriculture**: Effect of education on productivity agriculture.
- **Time for water stress to affect agriculture productivity**: Time for water stress to affect agriculture productivity.
- **Initial water stress index**: Initial water stress index.
- **Fraction of organic increase to fertilizer consumption**: Fraction of organic increase to fertilizer consumption.
- **Relative harvested area**: Relative harvested area.
- **Additional cost for organic fertilizer**: Additional cost for organic fertilizer.
- **Relative average adult literacy rate**: Relative average adult literacy rate.
- **Relative km of roads per ha**: Relative km of roads per ha.
- **Relative life expectancy**: Relative life expectancy.
- **Exchange rate**: Exchange rate.
- **Net fraction chemical fertilizer use**: Net fraction chemical fertilizer use.
- **Fraction chemical fertilizer use**: Fraction chemical fertilizer use.
- **Elasticity of productivity to price agriculture**: Elasticity of productivity to price agriculture.
- **Elasticity of yield to water stress**: Elasticity of yield to water stress.
- **Capital per ha**: Initial capital per ha.
- **Relative capital per ha**: Relative capital per ha.
- **Harvested area**: Harvested area.
- **Elasticity of fertilizer use on yield**: Elasticity of fertilizer use on yield.
- **Chemical fertilizer use**: Chemical fertilizer use.
- **Organic fertilizer use**: Organic fertilizer use.
- **Relative chemical fertilizer use**: Relative chemical fertilizer use.
- **Relative organic fertilizer use**: Relative organic fertilizer use.
- **Effect of water stress on agriculture productivity**: Effect of water stress on agriculture productivity.
- **Total factor productivity agriculture**: Total factor productivity agriculture.
- **Labor elasticity on yield**: Labor elasticity on yield.
- **Agriculture capital elasticity**: Agriculture capital elasticity.
- **Initial capital agriculture**: Initial capital agriculture.
- **Agriculture gross capital formation**: Agriculture gross capital formation.
- **Depreciation agriculture**: Depreciation agriculture.
- **Capital per ha**: Capital per ha.
- **Relative capital per ha**: Relative capital per ha.
- **Agriculture employment per hectare**: A...
28. : Industry module sketch
29. Services module sketch
30. GDP module sketch

- Initial real GDP
- Real GDP
- Relative real GDP
- Real GDP growth rate
- Initial real GDP growth rate
- Time to measure GDP growth
- Real GDP growth rate
- <Total population>
- Relative PC real GDP
- Initial real GDP per capita
- Real GDP per capita
- Real GDP factor price
- Ratio of GDP factor price to market prices
- <Time>
- Agriculture production
- Industry production
- Services production
- Market price
- Time
31. Investment and household module sketch
Government module sketch