Hands-on with LEAP

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Publication date: 2007

Citation (APA):
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• Data input and modeling in LEAP:
  • Direct data input: constants
  • Expressions: mining GDP – constant – growth rate - interpolation

• Expressions: planning reserve margin power sector
• Step(1999,0, 2002,20)
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- Exercise: Mining electricity intensity
- constant 2000- 2010 - double from 2010
- GDP-mining 10% growth annually

- What is the composition of mining energy consumption in current accounts?
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• Exercise: Power sector
• Change planning reserve margin to 15%
• What is the hydropower share of capacity in 2010?
• Export exogenous capacities to excel and make a graph of hydropower capacity
• - why is this correct without running the model?
Interpretation of Reference Scenario

- Reference scenario – business as usual (BAU) – forecast - projection?
- Focus on long term with historical data to 2003
- Energy scenario – not cost minimisation or cost calculation
- Energy demand – conversion and extraction
Reference Scenario
Assumptions

• Drivers
• GDP – intensities
• Shares
• Expansion plans and ressource variabels
Primary energy supply: Reference scenario

(adjusted to approximate NEB definitions)
Energy intensities for Malaysia 1999-2020

- **Final energy intensity**
- **Electricity intensity (right axes)**

[toe per RM mill]

- Year: 1999 to 2019
- Values range from approximately 100 to 160.
Net imports and self-sufficiency - here defined as \((\text{indigenous production}) / (\text{indigenous production + imports})\).
Global Warming Potential (GWP) intensities.
LEAP reference scenario examples

• New GDP assumptions: sectoral disaggregation
• Transport sector: road transport – air sea rail
• Road transport: passenger – freight
• Passenger: vehicle mileage
• vehicle fuel economy
LEAP GDP assumptions

- Disaggregated growth assumptions
- Example increase in service sector growth to 8% annually using excel file

- Exercise: Moderate growth: reduce growth rates for manufacturing in total to 4% from 2010 and services to 5% (use excel file)
LEAP fuel economy

- Disaggregated transport sectors
- Example: adjusting basic parameters for cars

- Exercise: Increase fuel economy by 5% in 2010 for cars of all types
LEAP mileage

• What is the interpretation of mileage

• Example: Use a new scenario to compare results - reduce mileage for cars in 2010 and onwards by 10%

• Exercise: Reduce mileage gradually to 16000 km in 2020 and only 18000 for diesel
LEAP scenario

• Construct a scenario containing the elements:
  • Increase the gas extraction of peninsular Malaysia from 2012 with 25%
  • Assume additional hydro capacity in PM and build a new hydro plant in 2015
  • Introduce hybrid cars on gasoline and electricity: assume fixed fuel shares e:25%
  • Standards reduce specific consumption for ac by 25% gradually from 2005 to 2020