Energy Data for Policy Analysis

Strategic Role of Energy Statistics in National and International Policies

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World Experience for Georgia

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Content

- **Short description of WEG:** objectives, activities with emphasis on activities using energy statistics
- **How does the WEG use energy statistics?** Do you also collect energy data? What sources of energy data do you use for your researches? Why do you think are energy statistics important for national and international policies?
- **What are the main issues and challenges** experienced regarding energy statistics in Georgia?
- **Suggestions** for the further development and improvement of energy statistics in Georgia?

Energy & Environment Think Tank

Established in 2006 to facilitate an access to best western knowledge and practice for Georgian society. Main activities - Research and Advocacy, education, informing, consultancy,
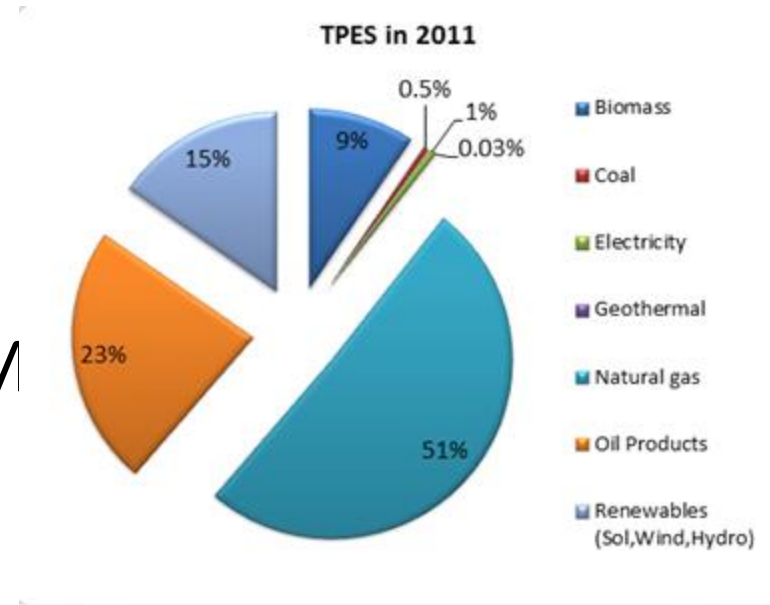
Activities:

- Energy planning – Development of country energy planning model MARKAL, hydropower model, etc.

- EE & RE – assessment of country's potential, legislation drafting, energy audits, design of EE & RE implementation policies & measures, pilot projects.

- Climate change – Technology Needs Assessment for Georgia, technology market & barrier analyses, technology action plans

- Energy Policy, energy strategy development

- Energy emergency planning, shale gas development planning

- Environmental & Social impact Assessments, Strategic EIAs, resettlement plans etc. for infrastructure projects

- Participation in Civil Society activities – member of EaP Civil Society Forum and Georgian National platform

Georgia's Energy Balance

- Not compiled officially since 2001
- No country's energy strategy
- 2008 work on EE and RE potential in Georgia
- Letter to the Government, PM highlighting policy issues
  - Forestry reform
  - External dependence Energy security policy
  - Seasonality – regional cooperation

TPES in 2011

- 9%
- 15%
- 23%
- 51%
- 0.5%
- 1%
- 0.03%

- Biomass
- Coal
- Electricity
- Geothermal
- Natural gas
- Oil Products
- Renewables (Sol,Wind,Hydro)

Sources of Energy Data in Georgia

- Statistics department not collecting energy data – no system in place
- ESCO – Electricity System Commercial Operator electricity data
- www.esco.ge
- Ministry of Energy and Natural Resources – electricity and a little bit of gas www.menr.gov.ge
- Difficulty in obtaining gas data – Gas Transportation Company www.gogc.ge
- Georgian National Energy and Water Regulatory Comission - www.gnerc.org
- Inquiries with Distribution companies - problem with customer categories
- No public data on coal
- No reliable data on oil product imports
- Customs department – import and export of goods
- Own expert assessments – *especially fuel wood*
- Voluntary unofficial balances
  - EEC, energy experts
- **Lack of transparency in energy information**
- **IEA balance for Georgia is approximate at best**

WEG- Analyzing EE & RE potential (2008)

- ## Energy saving potential

- ## RE potential

  Amount of biomass

  Wind data, solar, Small hydro,

  Geothermal potential

- ## Definitions

Technical, Achievable,

Economic - potentials

Energy Efficiency Measure	Energy Saved	
	Electricity (GWh)	Natural gas (mcm)
Improvement in distribution	500	180
Installation of Efficient Lighting	350	-
Weatherization	80	25-30
Energy Savings from instilling energy efficient behavior in society	150	20-30
Energy Savings in the Non-residential Sector	450 GWh	
Efficient wood burning	700K cm of wood	

RES Type	Theoretical Potential	Technical Potential	Achievable Potential	Economical Potential
Small Hydro	40 TWh	19.5 TWh	5TWh	
Wind	1300TWh		5TWh	
Bio Mass		12.5 TWh	3-4TWh	
Solar	1550 kWh/m^2			60-120GWh
Geothermal	300MW	100MW	700-800 GWh	

Tariff Methodology, Social Aspects

- Electricity stepped tariffs in Georgia
  - promote energy efficiency
    - 9.5t -   < 101kWh/month
    - 12.5t -   101-300kWh/month
    - 17.7t -   >300kWh/month
- Need to analyze the number of consumers in each category and variance in case of tariff change
    - September 2012
    - 1 step – 14%
    - 2 step –62%
    - 3 step –24%
- Social subsidies – evaluate the "social" amount of electricity and gas to be subsidized
- **Tariff is not a social subsidy tool**

Planning with MARKAL Georgia

MARKAL (MARKet ALlocation) is a widely applied bottom-up, dynamic technique, linear programming (LP) model developed by the Energy Technology Systems Analysis Program (ETSAP) of the International Energy Agency (IEA) .
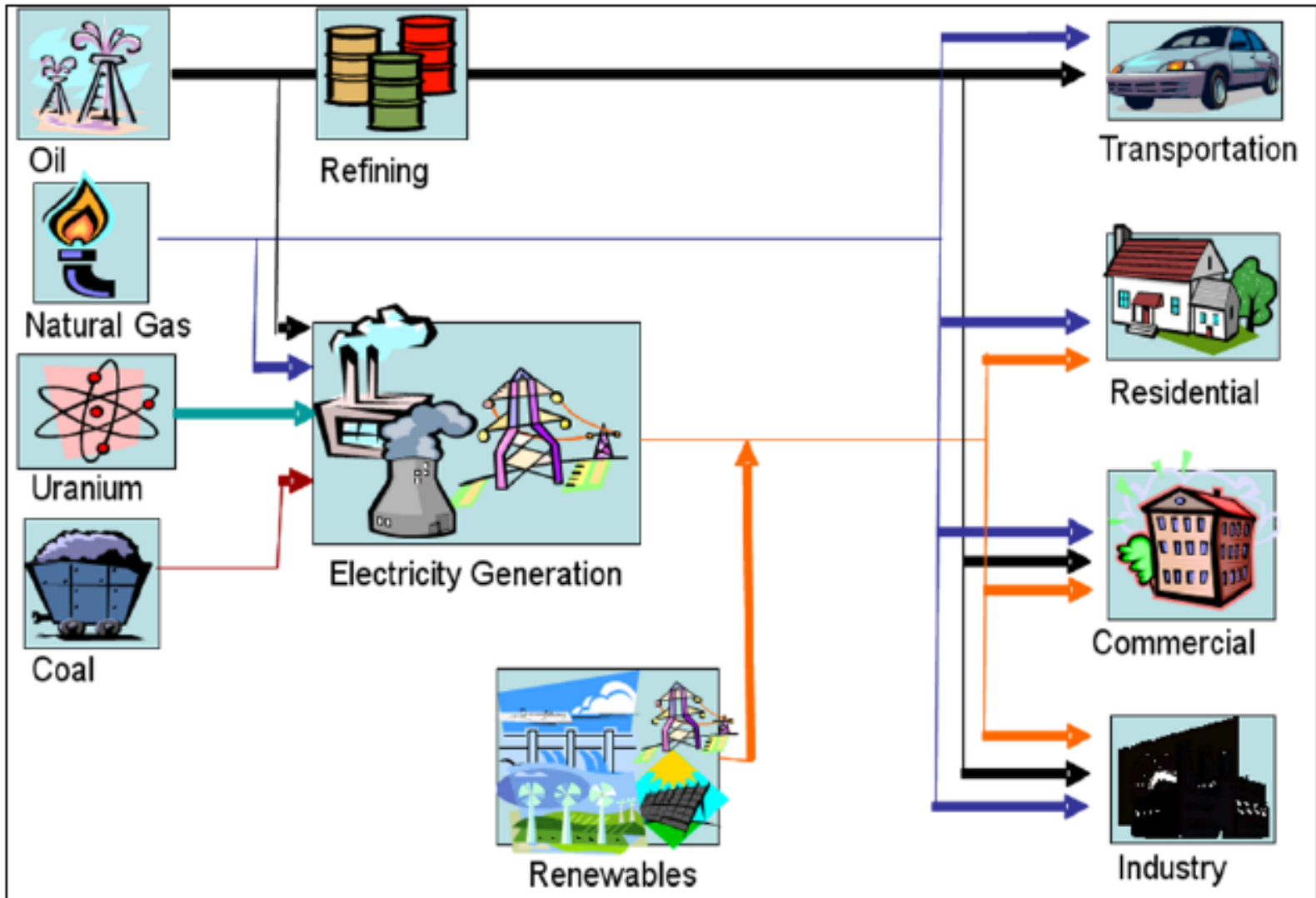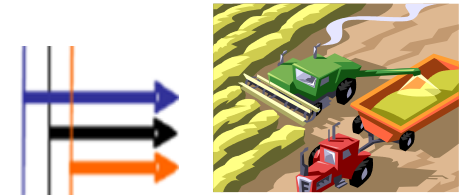
MARKAL is:

- "bottom-up" optimization model of the entire energy system of a single or several regions
- technology rich model, depicting the comprehensive energy system including
  - supply (imports/production)
  - upstream (refineries, power plants, and pipelines and grids)
  - demand devices providing demand services (e.g., heaters, lights, machine drives, cars)

  The model is adjusted to Georgian realities and ready for use by the Ministry.

Energy System

MARKAL data requirements

➢ Detailed National Energy balance and consumption by subsectors, and the splits down to the end-use level – Residential, Commercial, Industrial, Agriculture, Transport

➢ Useful Energy Demands / Energy Services (and Elasticities), and time of use - load duration curves by sector

➢ Detailed Costs of Technologies on supply and demand side
  • Investment, fixed, variable, fuel delivery

➢ Technology Characteristics
  • Installed capacity of technologies, new investment possibilities
  • Fuels in/out, efficiency, availability factors, technical life, etc.

➢ Environmental Impacts
  • Unit emissions per resource, per technology (operation, investment)
  • **Plans to monetize and include local environmental impacts (HPP problems)**

➢ System and other parameters
  • Discount rate, seasonal/day-night fractions

➢ Projections (GPD by sector, Population growth, fuel prices etc.)

➢ **DATA PROBLEMS**

➢ No Reliable Time Series – revolutions, dynamic evolution, war, economic crisis etc.

MARKAL RESULTS

Energy Balance - Final Energy by Fuel

Energy Balance - Final Energy by Sector
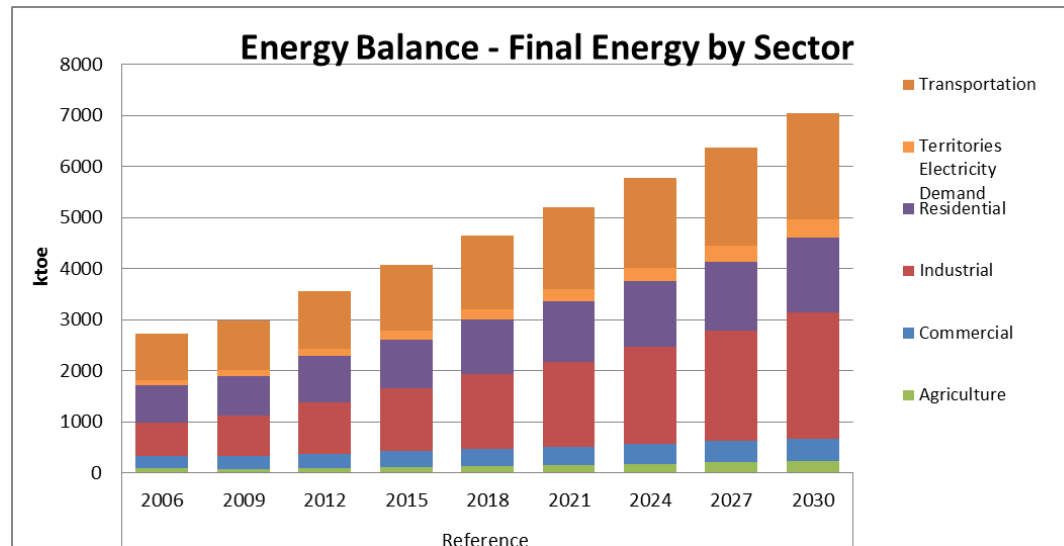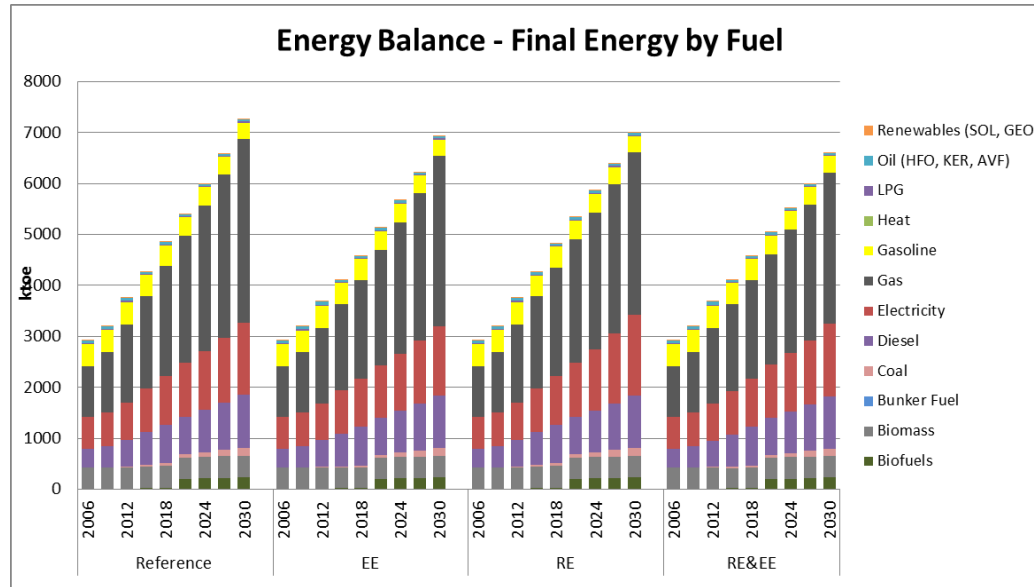
Climate Change

- **Energy data for inventory of GHG emissions**

Data accumulated by WEG was used in 3rd National Communication on Climate Change

- **CC Technology Needs Assessment (TNA)**

Identification of priority sectors, selection of preferred technologies in compliance with country's development priorities, market analysis and developing the Technology Action Plans as well as Pilot Project proposals

- Data needs for TNA
  - Wood fuel potential
  - Annual wood cutting/annual wood consumption
  - Number of rural households consuming wood for heating
  - Heating technologies in rural areas
  - Number of new built buildings (annual)
  - Emissions from sectors
  - EE level of new buildings(absence of buildings passports)

Collecting Data – Energy Audits in Residential Block Buildings in Tbilisi

- Designing EE & RE measures
  - Solar and geothermal hot water
  - Thermal insulation
  - Window & Door replacement
  - Exterior improvement

- Households surveys for energy consumption data
  - Questionnaires
  - Utility bills
  - Measurements of temperature
  - Thermal imaging

- Social aspects – quality of life, unsatisfied energy needs

CSO Activities

- **EaP Civil Society Forum** - Energy Security Index - Benchmarking of different countries vs. EU Energy Aquis requirements and EaP goals
- 4R+R=5R Review, Reduce, Replace, Restrict, Relate
- Energy balance indicating internal and external energy sources
- Share of renewable energy in country's energy balance
- Existence of traditional and non-traditional energy reserves
- Energy storage capacity and security reserves
- Energy consumption intensity (per capita, per $GDP)
- Energy availability and affordability (energy prices by sectors, share of energy in household expenditures)
- Energy Statistics & energy information transparency availability
- R2- Sector energy intensities and saving potential

CSO Activities

- **Georgia National Platform**
    - Promotion of EE & RE legislation – energy intensities, etc
    - Promotion of transparency and energy data availability
    - Development of Energy Statistics – Energy Balance
    - Conformance to international obligations and EU Aquis

ADB "ASSESSMENT OF POWER SECTOR REFORMS IN GEORGIA"

- Time series in energy production and consumption data to highlight the effect of policies and reforms.

Electricity Balance 1990-2011
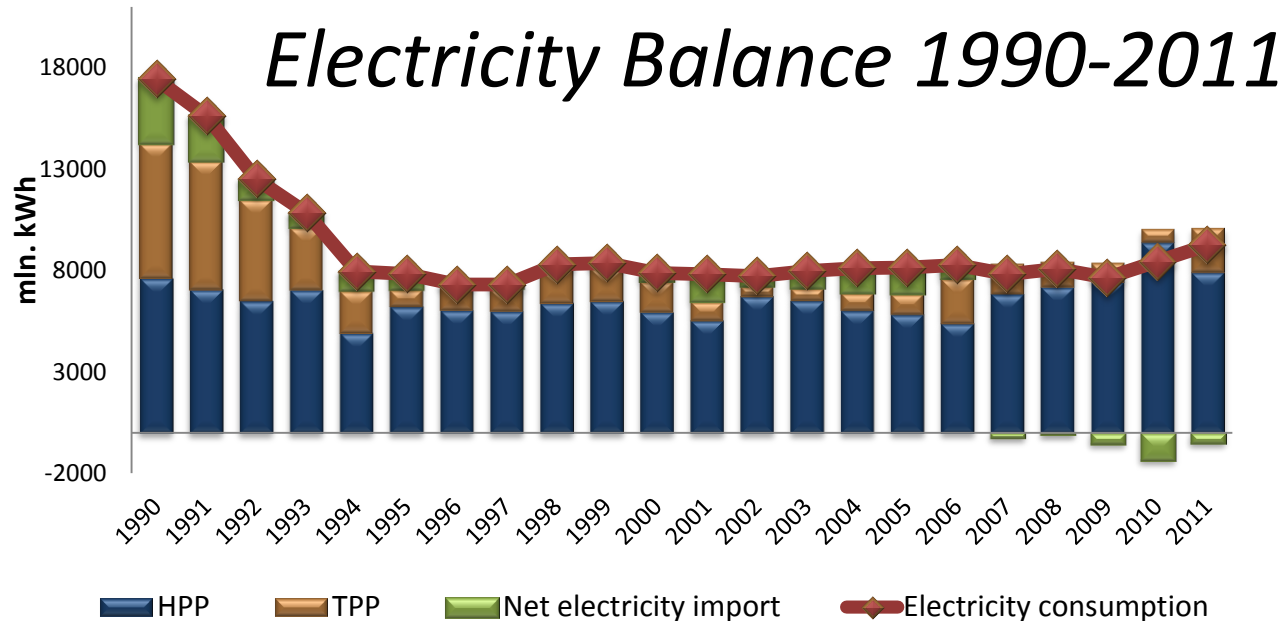
System breakdown and restoration wars,
"revolutions", dynamic evolution, economic crisis, energy sabotage 2006
etc. Limited predictive power

Main issues and challenges experienced with energy statistics in Georgia

- Difficulty of getting data from energy companies
  - unification of definitions,
  - commercial vs. residential,
  - periodic update
- Lack of valid, real-time and complete energy data
- Household and small commercial sector consumption
- Lack and limited relevance of historical energy data
- Bureaucracy – no rules on data disclosure
- No clear and legal obligation for public/private organizations to collect and supply energy data
- **Opportunities – Ongoing donor projects and Covenant of Mayors activities**

Importance of Better Energy Statistics

- Policies
  - Country Energy strategy - energy security, energy projections, major decisions on development of own energy sources, RE and EE policies, investment etc.
  - EU association – benchmarking, energy security requirements,
  - Climate Change – emissions inventory, NAMAS, CDM
  - EE & RE strategies and action plans – basic data
  - Social subsidies
  - Etc.

Suggestions

- Energy balance is being addressed - system needs to be established with tasks and responsibilities

- Help with professional survey methodology

- Unification of distribution company reporting

- Transport data needs to be developed –

- Building sector needs to be studied

- Transparency of energy data needs to be established at policy level

- Impose clear and legal obligation to the organizations collecting energy data,

- Improve coordination among public and private organizations

- Energy professionals participation in the process

- Better government and donor coordination

Thank You

www.weg.ge