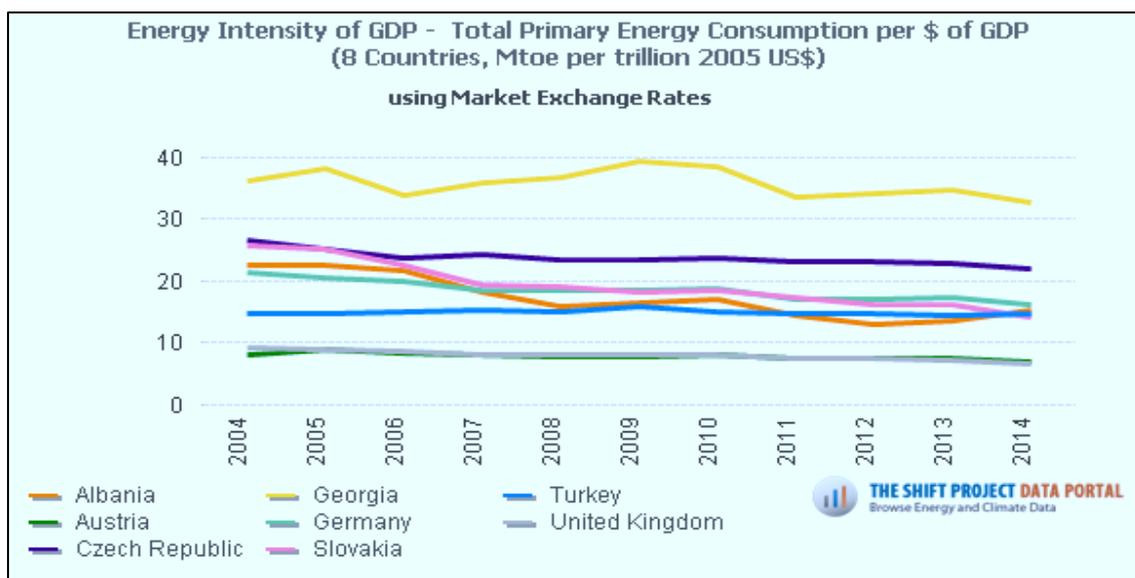
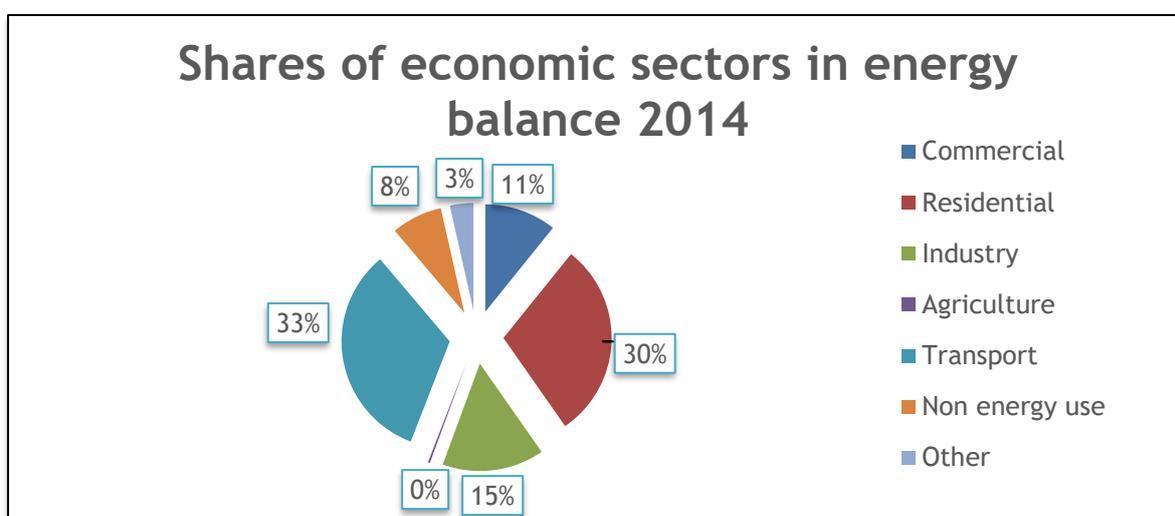


Georgia's industry sector brief overview

The data (energy statistics 2014) of final energy demand according to the sectors in Georgia shows that industry is among other main energy consuming sectors, such as residential and transport. Although, consumption by industry is less comparing to the residential and transport sectors, these two sectors are relatively large consumers of natural gas and oil products, both of which are mainly imported. Georgia's industrial sector is smaller than other countries and compared to other countries Georgian economy does not have much energy intensive industry. Although, it's GDP intensity is still much higher than, for instance, in Turkey, which has a much more energy intensive economic structure. This indicates that there is potential for energy efficiency improvements.



According to the “Georgia 2020” strategy, the Government plans to develop policies aimed at developing transport infrastructure and the maximum realisation of transit potential. The increased number of infrastructure projects will increase the level of activity (and therefore energy consumption) in the Construction sub sector which will affect energy consumption of the Industry sector as a whole – causing it to increase. According to the Strategy to 2020, small and medium businesses are going to be supported by the government through policies and regulations as well as there will be support for the development of entrepreneurship and new businesses. This in turn will lead to development of different Industry subsectors and require a sustainable energy supply.

Despite that country’s strategy towards industry, energy efficiency policy, which will incentivise and to boost improvement of energy efficiency in the field, is not yet adopted. However, policy is expected to be in place after elaboration of Primary Energy Efficiency Law and implementation of national energy efficiency action plan, which is a draft and is being developed.

Until now programs and projects which have been implemented in Georgian industry sector to promote and improve energy efficiency conditions, were developed by the international organizations only. UNIDO and EBRD are strong supporters and have implemented number of programs. However, in order to reach sustainability of the process it is very crucial to have a well formulated policy and incentivizing mechanisms, tailored to existing circumstances, led by the Government. It has to be mentioned that in Georgian energy market is partially deregulated, energy prices are low comparing to EU and other non EU member countries. Therefore, energy prices are not driving factor for energy efficiency improvements. There are some companies having industrial factories and the hydro power plant as well. In addition to that lack of awareness and worth behavioural activities are major factor of neglecting energy efficiency and energy saving in the industry. Though, there are cases when industry representatives are investing to change technologies to become more efficient, e.g. cement industry is in process of switching from wet-cement process to dry cement process.

Special features in energy consumption

Food, beverages and tobacco are often cited as an important industrial sector in Georgia, yet based on the 2014 data; it represents only 6% of the industry total energy. In theory, this would be a sector with lots of recurring opportunities, where Government support should help generate cost-effective savings. However, with only 606.9 GWh/year consumption, valued at approximately EUR 20-25 million per year, even a 30% reduction would be worth only EUR 6-8 million per year. It seems possible that Food & Drink may have been under-reported.

The chemicals (including petrochemicals) sub-sector is likely also under-reported for production. Furthermore, within this sub-sector it is difficult to justify 2,516 GWh/year as entirely non-energy use of natural gas. This gas will be used both as a fuel and feedstock because site will benefit from the energy released during processing. Some of this amount may be partly or fully re-assigned to energy.

Metal processing now accounts for nearly 25% of the total industry energy. The majority of the delivered energy is either coal (ferro-manganese) or electricity, which suggests electric melting of steel.

Construction accounts for over 10% of consumption in industry, although a large proportion of this is non-energy use of oil-based fuels – bitumen for roads.

The paper, wood, textile and engineering sectors all appear to be small consumers of energy. This is particularly surprising as relates to engineering, which typically comprises a large SME “tail” of companies, and this estimate would benefit from review.

Based on reviews of audits and sites visits conducted during the preparation of the national energy efficiency action plan, industry energy savings will come from 4 main routes:

1. **No/low cost energy-saving from good energy management and control**, which is also an enabling step to identifying and eliminating poor behaviour/ bad practice. These include:
 - Understanding site energy consumption patterns, through suitable sub-metering and software;
 - Identifying and eliminating poor-practices, “good-housekeeping”, behavioural changes;
 - Attention to planning and scheduling for optimum efficiency;
 - Identifying and financially assessing low-cost technical opportunities.
2. **Low-cost technical opportunities**, which naturally follow good energy management. Some of the more important being:
 - Thermal insulation on steam/ hot-water/ refrigerant gas pipes;
 - Attention to steam leaks, steam traps, maximum condensate returns, etc.;
 - Compressed air leak detection, water traps, etc.
 - Upgrades to building fabric: glazing, roof and wall insulation;
 - Lighting: replacing HID (High Intensity Discharge), incandescent or old style T8 tubes with EE LED lighting.
3. **Sector specific technical investment opportunities**: Traditionally, this is what emerging nations focus upon. There are several excellent sector-specific opportunities within Georgia. Details of two of these – steel and cement – are provided in the list of measures.
4. **Cross-sector investment opportunities common to several industrial sectors**: Four of the more important are also provided in the list of measures:
 - Boilers and Steam/ hot water systems: combination of no/low cost EE actions combined with replacing old (inefficient, over-sized) boilers with new, correctly sized EE boilers
 - Refrigeration compressors and distribution systems – similar comments related to replacing old (inefficient, oversized) refrigeration units with new, correctly sized ones.
 - Motors: replacing old (inefficient and over-sized) motors with new, correctly sized IE3 or better motors, where applicable with Variable Speed Drive (VSD) controls.
 - Lighting: concerted effort to upgrade, particularly incandescent lights with LED equivalents.

Key barriers and drivers of investments

There are several key drivers of and barriers to investment in the industry sector, some of which have already been discussed in Section **Error! Reference source not found.**. These include:

Technology & Equipment: Historically, there has been little or no investment in energy-saving equipment; for some sites this is an issue that goes back decades. There is still a great deal of Soviet style equipment still in use that:

- Is old technology, built with robustness rather than efficiency in mind;
- Was built at a time when energy costs were subsidized; efficiency was not a prime consideration;
- Was oversized even for outputs in the 1960's – 80's; oversized equipment is inherently inefficient compared with correctly sized units. With continued reduction in demand, this oversize issue has become more acute.

Mentality and awareness: The mind-set of industry is still production driven, a historic mind-set and not entirely due to the poor state of the economy. There is limited awareness of modern energy management techniques and EE technologies relevant to the site. This is more prevalent for SME organisations and less so for some of the larger organisations.

Energy Management: There is limited understanding of where energy is consumed across each site. This is true for electricity consumption and secondary energy consumption such as steam, hot water, or compressed air. For example, the consumption at the boiler may be known but where this heat is used is not known.

External support and skills/ expertise: As previously discussed in Section **Error! Reference source not found.**, unlike EU Member States, there is very little independent energy-efficiency expertise that Georgian industry can draw-on, including generic / cross-sector technologies and sector-specific technologies.

Limited funds or opportunity to borrow: The Georgian industrial sector has had significant market-based problems, particularly in the past 2 years. Many long-standing export markets: Russia, Ukraine and other Regional countries – have been directly or indirectly affected by conflicts or embargos, which has reduced export demand hence production. Issues, such as EE, are a long way down the priority list. Even when good EE investment opportunities are identified by site managers or by external consultants, there is limited opportunity to borrow for investment.

Low energy costs: Although unit costs have been rising substantially in recent years and are now approx. 50 – 70 EUR/MWh (electricity) and 20 to 25 EUR/MWh (natural gas), they are still only around 50% (electricity) to 70% (natural gas) of the unit costs for EU industry.

High cost for investment in EE technologies: There is no local production of EE equipment: boilers, furnaces, motors, etc. As such, Georgian industry has to pay international prices for any EE equipment plus transport and any import levies. Therefore, investments in energy efficiency will not necessarily be cheaper in Georgia due to other things (such as labour) being cheaper. Certainly there

are cases where individual investment costs are lower, but in general, investment costs tend to be just as high as other countries. Given the lower energy costs (in absolute terms), this makes investments less attractive than in many other countries.

Lack of incentives, covering several areas: There are currently no incentive-based mechanisms to encourage energy efficiency or renewable energy in industry – such as for example:

- Negotiated Energy agreements to reduce energy prices for those achieving efficient production;
- A trading scheme such as a “white certificate” system for selling excess energy savings over and above the agreed target.
- Incentives for waste-heat recovery – i.e. for cogeneration of electricity from high-temperature waste streams; investments are straightforward commercial decisions;
- Energy-from-waste (EfW) is not incentivised; currently there is no municipal waste-separation nor any gate-fee/ landfill tax. In EU Member States, avoiding waste disposal costs make EfW plants commercially attractive.

The main investment incentive appears to be the “Produced in Georgia” programme; which offers up to 10% off the interest rates for the first 5 years of loans to organizations making tangible goods.

Data limitations

It appears there may be some issues in the data collection of energy consumption and goods production in the industry sector in Georgia – as outlined above. The estimates of energy efficiency potentials represented in the measures below are based on energy audits and interviews in over 30 industrial enterprises, including larger companies and SMEs. However, in order to have a clearer picture of the potential for efficiency measures, improved data disaggregation and a large number of new energy audits would be beneficial – and also likely trigger investments.

Plans for obliging large enterprises to carry out energy audits or have an energy management system in place

As part of the 2012 Energy Efficiency Directive¹, Article 8 obliged all “non-SME” organisations (i.e. large businesses) within EU Member States to introduce:

- Mandatory energy auditing of at least 90% of the Organisation’s estate every 4 years, or
- Independent certification of a recognized Energy Management system standards (e.g. ISO 50001).

The deadline for implementation of the first round of mandatory energy auditing was 5 December 2015. Non-Member States applying for EU membership were expected to harmonize with this

¹ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.

Directive. The Energy Community then adopted a decision for implementation of the directive² which sets the deadline for the first round of mandatory energy audits as being complete by 5 November 2018. Given the late start with this system, it is unlikely that Georgia will meet this deadline, but it is likely that the system will be in place by this date and that audits will be underway.

It is important to note that the EU definition for a “large” organisation is rather different from Georgia’s current definition. The EU defines a large organisation as:

- 250 employees (per Member State) or
- Turnover of more than EUR 50 million and assets of more than EUR 43 million

Whereas Georgia has the following definitions:

- **Large:** turnover more than 1.5 million GEL per year (approx. EUR 500,000 per year) and over 100 employees. Both criteria need to be met for the company to be considered large.
- **Medium:** turnover of between 0.5 – 1.5 million GEL per year and between 20-100 employees
- **Small:** turnover of less than 0.5 million GEL per year and less than 20 employees. The company is considered small if either of these criteria is met.

Georgia plans to change its definitions to become more in-line with EU standards.

According to Geostat data, in 2013, there were 536 “large”, 661 “medium” and 5,487 “small” industrial organisations in Georgia – using the Georgian definition. Using the EU definition, the NEEAP team estimate there are between 50 and 100 “large” industrial organisations and a further 1,100 – 1,250 “medium” organisations in Georgia.

² Decision of the Ministerial Council of the Energy Community # D/2015/08/MC-EnC: on the implementation of the Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC. Dated 8 December, 2015.