

Energy prices in energy statistics (and IRES)

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Introduction

In energy statistics data on physical volumes and energy content is collected and disseminated. In economic statistics as national accounts, which also covers energy commodities, it is basic to include data in value (money) terms. In the interface between statistics on values and statistics on volume, you have prices. It is important to determine the role of price data in official energy statistics.

At the first Oslo Group meeting in February 2006 the results from a short UNSD questionnaire on Energy Balances were presented. One recommendation from the countries in this survey was to have an “energy price manual – focusing on recommendations for data collection on prices and taxes”. This has not been discussed in the Oslo Group after 2006, and has hence not been an active part of the discussion on the contents of IRES. How should prices be included in IRES?

Relation volume, value, price

A basic identity to take account for is the relation between volume, value and prices, so also for energy. These three are logically connected in the mathematical relation that:

$$- \text{Value} = \text{volume} \times \text{price}$$

This basic relation tells us that if we know two of the variables the third is determined. A strategy where we collect independent data on all three variables should be avoided.

This relation may also be considered when selecting a strategy for data collection.

User needs – increased demand for price information

Prices are increasingly important as an integrated part of the statistical system for national energy markets, especially after deregulation. Prices may be observed from markets, through for instance energy exchanges. In some countries this exchange information is supported by special statistical surveys as a part of official statistics. For instance, as part of export and import statistics we will in most countries find import and export prices for energy. As a part of business statistics we will find producer price indexes also covering energy. In National Accounts the price matrix also for energy plays an important role.

Prices by itself are among the most popular items from statistics on the energy sector. What are the oil prices, petrol prices and electricity prices? Prices are important as market information, but also instrumental in monitoring how the energy markets are functioning, for instance related to competition monitoring. Information on prices is also a key for analytical purposes related to energy markets.

Price information

Energy prices will in many markets be registered and made transparent in trading markets (exchanges) for energy. This market information may be from international markets or national markets. The market prices may be spot prices. Official statistics on energy prices has to take account of these market prices.

Energy prices will in systems for official statistics be a part of the system for producer prices, export and import prices and also measured for the CPI. If special price surveys are established as a part of energy statistics – consistency with the other prices observed has to be considered.

Price in quality work

Price information is an important part of quality work. One important approach is to use the value-volume-price relation actively in quality work and in the work with checking consistency and balances. Another is to use the relation related to data collection. If you have access to information on two out of three of the volume-value-price components, asking for the third would be over absorption and increase the response burden.

The Norwegian oil statistics can serve as an example. Data on the production of oil and gas are collected from the Petroleum directorate, who has collected data from the companies. Statistics Norway asks the companies only for information on prices on gas and oil. These prices are compared with import/export price information from foreign trade statistics. By combining production data and prices, the values are calculated. All these data are also included in National Accounts and their calculation of constant prices. By this use of data, both the data from the Petroleum directorate, the price information from the companies and foreign trade, and the value calculations are controlled for inconsistencies, without asking the companies for additional information. Data are collected once, and used many times, and information on prices is a key to do this.

Another consistency check can be done if data on both volume and value are available. Then you can check if the implicit price (value/volume) seems reasonable compared to other price information on the product at hand. This sort of consistency checks are often used in basic energy statistics, but may also be used in statistics putting different sources together, for instance National Accounts.

Status in countries and organisations

In energy statistics produced both in countries and international organisations, collection and dissemination of energy statistics mainly focus on volume. These data are the input to energy balances and are related to both extraction of resources/assets on the one hand and security of energy supply and setup of emissions inventories on the other. Volume data are also essential in the link to energy content, and hence energy planning in this respect.

Some price information are collected and published by the international organisations. Eurostat collect and publish data on half yearly prices for electricity and gas from the member countries, and IEA publishes "Energy prices and taxes" quarterly. It seems as, at the present, the National Statistical Organisations are involved in a very limited way in this work.

We expect that amongst the countries there are large differences as to how energy prices are used or calculated nationally, and to what extent these data are published. Data on revenues from economic statistics are available for many parts of the economy in most countries, but to what extent these data are seen in relation to volume data we do not know.

Papers for Statistical Commission 2005 and 2006

Statistics Norway in 2005 presented a programme review on energy statistics and in 2006 a document on quality components of oil statistics to Statistical Commission 2006 (E/CN.3/2006/11). As discussed in this paper, prices are important data items in consistent systems for both energy statistics in general and oil statistics. The paper illustrate the importance of prices as market information, as input in National Accounts calculations and that prices are essential to ensure consistency between values and volumes in the balancing of production, consumption, exports and imports.

Challenges related to collection of price data

There are a lot of challenges related to collecting energy prices. When recommending a methodology, one has to focus on the challenge of getting comparable energy prices. After deregulation of many energy markets this has become even more challenging. There are data on spot prices, but also different kinds of contracts for large clients, or for delivery x months into the future. There are also some difficulties related to different prices for energy sold to other parts of the same corporation, than on energy sold to others.

Prices are also complicated due to for instance taxes. Are the prices available with or without taxes? There are a lot of variations between different countries. This is an important challenge in order to get comparable price data.

A recommendation on methods related to collection of price data must be consistent amongst the organisations and countries, and must be developed in cooperation between the organisations (InterEnerStat) and countries (OG).

Recommendations and conclusions

The question is how energy prices should be included in international recommendations.

Our proposal:

- To have energy price surveys as a part of official energy statistics should be optional.
- International reporting of energy prices is relevant and should be coordinated.
- The role of national official energy statistics in energy price reporting to international organisations should be clearer.

One option for IRES may be to include all the aspects of volume, value and prices, and not just volume in all chapters of IRES. Prices are especially relevant to the chapters on “scope of official energy statistics”, “statistical units and data items”, “data sources and data compilation strategies” and “data quality”.

Another option may be to add an extra chapter on prices to IRES.

Based on the draft outline for revision of UN manuals, we propose that the principles are included in the international recommendations on energy statistics, whilst the operational aspects are included as parts of the compilers manual. ESCM would hence also include, amongst other factors, data collection challenges for prices and examples of use of prices as part of consistency checks of energy data.

In addressing these issues, an open cooperation on these issues between the organisations (InterEnerStat) and the countries (OG) are essential.