

# **Micro power plants**

By: Magne Holstad  
Statistics Norway

**Contents**

- 1. Introduction.....3**
- 2. Micro power plants in Norway.....3**
- 3. Micro power plants and electricity statistics..... 3**
- 4. Conclusion.....4**
- 5. Points for discussion.....4**

# 1. Introduction

Different countries may have different capacity limits for the classification of a power station as a micro power plant. This paper describes how micro power plants are defined in Statistics Norway's annual electricity statistics. In statistics we want to have a total count. However, this depends on whether we have administrative or statistical data. Statistics Norway has a co-operation with the Norwegian Water Resources and Energy Directorate on most of the data collection. In addition, Statistics Norway collects data from manufacturing companies producing electricity for its own use (autoproducers), for getting a complete picture of the supply and use of electricity. The annual electricity statistics do not contain micro power plants, a principle which is elaborated below.

## 2. Micro power plants in Norway

In Norway the concept 'micro power plants' refers to power stations with an installed capacity of less than 100 kW. Installed capacity refers to the potential or theoretical maximum production. If a power station has an installed capacity equal to 100 kW and produces 8760 hours during a year, this gives an annual production of electricity equal to 876 000 kWh or 876 MWh. However, figures from the annual electricity statistics in table 2.1 below show that the production as a percentage of installed capacity is always considerably lower than 100 per cent. Due to different inflow of water to the reservoirs<sup>1</sup> and variation in the electricity consumption a power station will never produce at maximum capacity during a year.

Table 2.1

Year	Production of electricity	Theoretical production	Production as a percentage of theoretical production
2000	142,3	246,4	57,8
2001	121,0	242,5	49,9
2002	129,8	244,5	53,1
2003	106,1	245,2	43,3
2004	109,3	245,5	44,5
2005	136,5	251,8	54,2
2006	119,7	253,3	47,3

The production is measured in TWh.

## 3. Micro power plants and electricity statistics

The purpose of the annual electricity statistics is to give an overview of the production and consumption of electricity. Hence, from a statistical point of view, micro power plants should be included in electricity statistics. On the other hand, Statistics Norway emphasizes to minimize the response burden of enterprises and establishments. It is therefore important to establish the impact on the production data in table 2.1 if the annual electricity statistics were to include micro power plants.

According to the Norwegian Water Resources and Energy Directorate, approximately 200 micro power plants produced electricity in 2007. Although the installed capacity in micro power plants is different, we simplify the calculations by assuming that the installed capacity is equal to 100 kW in every micro power plant. Moreover, we assume that there were 200 micro power plants in each year in the period 2000-2006 and that the production in the micro power plants as a percentage of theoretical production was equal to the figures in table 2.1.

---

<sup>1</sup> Almost the entire Norwegian power system is based on hydro power.

Table 3.1 below shows that the production of electricity in micro power plants accounts for a small share of the production in the annual electricity statistics. More precisely, the micro power plants generation accounts for 0.1 per cent of the production. Hence, in practice the annual electricity statistics represent a total count of all power plants in Norway. Since the production in micro power plants is only of a theoretical matter, it is appropriate to exclude them from the annual electricity statistics in order to minimize the response burden.

Table 3.1

Year	Production of electricity, TWh	Production in micro power plants, TWh
2000	142,3	0,1
2001	121,0	0,09
2002	129,8	0,09
2003	106,1	0,08
2004	109,3	0,08
2005	136,5	0,09
2006	119,7	0,08

## 4. Conclusion

Different countries may have different capacity limits for the classification of a power station as a micro power plant. Statistics Norway has chosen to use the term micro power plants for power stations that have an installed capacity of less than 100 kW. In addition, the annual electricity statistics do not include micro power plants. It is important to emphasise that this way of dealing with micro power plants may not be the optimal solution for other countries. For instance, the ratio of micro power plants and other power plants may differ considerably between countries.

When a country decides on appropriate cut off points for power stations in electricity statistics, two aspects should be evaluated.

Firstly, the electricity statistics should present an overall picture of the production and consumption. If the electricity production of excluded power stations is distributed to other consumer groups, it will lead to imbalances between production and consumption. Hence, the cut off points for power stations in the electricity statistics should be so that the excluded production is only of a theoretical matter. According to information from the Norwegian Water Resources and Energy Directorate approximately 5-10 micro power plants had no grid connection in 2007.

Secondly, the response burden should be as low as possible.

## 5. Points for discussion

- How much of the production should be covered in order to get a “complete” picture of consumption and production of electricity?
- In Norway the term micro power plant refers to hydro power stations. Should the discussion also be extended to other energy sources like wind power, solar energy etc?