

# Discussion paper: On the valuation of renewable energy resources

Prepared for London Group meeting by:

*Maarten van Rossum and Sjoerd Schenau  
Statistics Netherlands*

December 2009  
Wiesbaden



# Objective of discussion paper

At the 14th Meeting of the London Group on Environmental Accounting (Canberra, 27 – 30 April 2009) the issue paper 'Renewable energy resources in the SEEA' was presented and discussed. The discussion in the London Group put forward four main questions. The objective of discussion paper is to answer these questions:

- *Is the value of renewable energy resources, like solar radiation and wind, already incorporated into the value of "land"?(part 1)*
- *Should we include subsidies in the resource rent or not?(part 2)*
- *Is there a problem with the fact that more fixed assets will lead to a higher valuation of renewable energy resources? (part 3)*
- *How to deal with other renewable natural resources, for example geothermal energy and tidal stream energy? (part 4)*

# Part 1. Land and renewable resources: Both assets or not?

- The price of land is explained by the scarcity of space and the opportunity costs related to the use options of the land under consideration. In optimizing the land use possibilities of a particular piece of land, all these opportunity costs are taken into account before a decision on final land use is taken.
- The resource rent related to renewable energy production is in theory already incorporated into the value of land.
- **→ it is not recommended to include renewable resources like wind and solar radiation on the balance of a country**

# Part 1. Land and renewable resources: both assets or not?

- It is wrong to create a new asset called 'renewable energy resource' and put it on the balance of a country. This will inevitably lead to double counting.

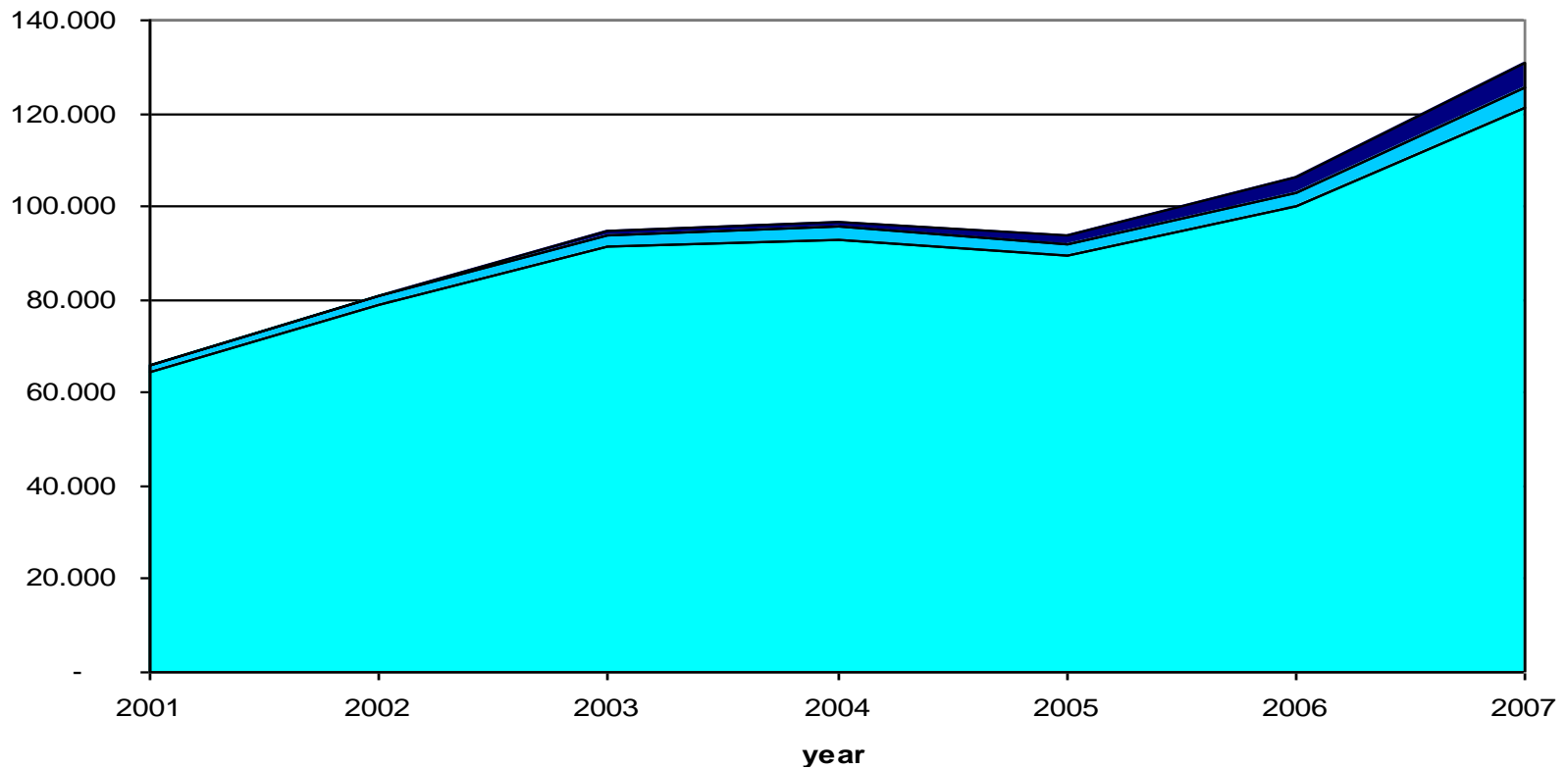
*Although.....*

- ...it is still desired to decompose the value of the asset 'land' into a value for renewable energy resources and a value for the physical land itself. This decomposition is desired because renewable energy resources are separate inputs in the production process. From a SEEA perspective, this decomposition is interesting to monitor over time.

# Measurement of sustainable development; the capital approach for energy resources; energy availability

## Valuation of energy resources in the Netherlands

mIn euro



■ Natural gas   ■ Crude oil   ■ Wind

# Part 1. Land and renewable resources: Both assets or not?

- Surplus income can be the result of market failure (not embodied in the price of land) and can be the result of not taken into account certain capital services of hidden capital assets. Because it is extremely difficult to isolate real resource rent and rent due to market failure, it is proposed to treat all *computed* rent as resource rent (analogous to oil and gas reserves). This rent forms the basis for valuation.
  - Land rent can be absent or underestimated. It would be informative to monitor the capital services of land where renewable energy systems are installed.
- **All rents and financial cash flows related to renewable energy production should be summarized in the SEEA.**
- **It is recommended to include this topic in volume 3 of SEEA.**

# Application: give a clear overview of all variables of interest for renewable energy

- Operating surplus of renewable energy production
- Lease price of land used for renewable energy production
- Capital services of fixed capital
- Depreciation of fixed capital
- Transfers related to implicit subsidies on capital investments
- Subsidies on products
- Investments in renewable fixed capital
- Capital stock of renewable fixed assets
- Value of renewable energy resources
- Rent of renewable energy resources
- Others...

# Part 2. Subsidies on renewable energy production and resource rent

- From the **SNA framework** for measuring productivity and calculating resource rent, it follows that subsidies on products as well as implicit subsidies should not be attributed to renewable energy resources and consequently should not be included in the resource rent.
- For the **SEEA** it is recommended to at least monitor subsidies on products as well as other subsidies related to renewable energy production. This is because subsidies are very important drivers for investment decisions. In other words, subsidies are an important financing item for renewable energy projects.
- It is important to monitor renewable energy subsidies....



# Part 2. Subsidies on renewable energy production and resource rent

- Subsidies on green electricity production have an indirect effect on the price of other energy carriers, like for example natural gas. Subsidies have hereby an effect on the valuation of natural gas reserves. It seems not logical to take into account an indirect effect of green subsidies on non renewable natural resources and not to take into account the direct effect of the subsidies on renewable natural resources.
- Parallel between valuation of collective goods and the valuation of less negative external effects. In both cases, the free rider problem is solved by government intervention. At the macro level, after redistribution of taxes and subsidies, the market values the technology to produce green products more than the technology to produce grey products. The government has here a distribution of income function highlighting a certain preference for a particular production method and capital input.

## Part 2. Subsidies on renewable energy production and resource rent

- Is the objective of SEEA (valuation of externalities and public goods (clean air) colliding with the valuation principles of SNA?
- SNA does not recognise the atmosphere as an asset
- SEEA does recognise the atmosphere as an asset
- Should valuation of heavily subsidized environmental friendly inputs be done after redistribution of taxes and subsidies? If not, then the value of public goods (less emissions) is underestimated because the market does not recognise/value certain production inputs before implementation of the subsidy schemes.

# Part 2. Subsidies on renewable energy production and resource rent

→ Do we want to measure social preferences in the SEEA in relation to energy resources? If yes, do we have to take subsidies into account?

Options we have:

- Apply SNA rules for valuation
- Social valuation of energy resources should only be done in volume III
- Do we need to reconsider SNA-valuation principles in volume I?

What the opinion of the LG think regarding these issues? (see questions for LG group)



## Part 3. More fixed assets will lead to a higher valuation of renewable energy resources

- There is a strong link between the fixed assets and the value of the renewable resource. Renewable energy resources emerge when benefits are there and disappear when benefits vanish. Favourable market circumstances can increase comparative advantages of renewable energy producers → more investment
  - Analogous: When new mining technology develops, investment in new mining infrastructure can lead to more mineral reserves. This leads to a higher valuation of mineral reserves.
- So this strong link is no problem for valuation

# Part 4. Treatment for tidal stream and geothermal energy

- Resource rent related to tidal stream and geothermal energy is treated **the same** as resource rent related to wind energy and solar radiation.
- For both tidal stream and geothermal energy holds that characteristics of the landscape and its surroundings are essential in creating potential resource rents. The characteristics of the landscape are, in theory, already valued and incorporated into the value of land.

# Questions to the LG

- 1. *Does the LG agree that in theory the rent related to renewable energy production is already incorporated into the value of land?*
- 2. *Does the LG agree that 'rent' generated by renewable energy production, although already incorporated in land, should be highlighted in volume 3?*
- 3. *Does the LG agree that the topic of resource rent related to renewable energy production and its corresponding valuation issues should be included in SEEA volume 3 and not in volume 1 and 2?*

# Questions to the LG

- 4. *Does the LG group (dis)agree that subsidies on renewable energy should not be taken into account in calculating the resource rent and valuing renewable energy resources?*
- 5. *Does the LG group (dis)agree that the arguments 'redistribution of income' and 'interrelating assets' are reasons to divert from the standard approach for valuation?*
- 6. *Does the LG group agree that it is no problem that more fixed assets eventually can lead to more resource rent and thereby to a higher valuation of renewable resources?*
- 7. *Does the LG group agree that tidal stream and geothermal energy should be handled the same as solar radiation and wind energy?*