System effects of the subsidy regime for wind power in Sweden and Denmark.

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1. SYNOPSIS.

Generous production subsidies cause irrational system effects: Collision with energy saving goals, excessive capital costs, dubious siting decisions, and distorted competition among technologies.

2. ABSTRACT.

This study comprise analysis and discussion of incentives inherent in the Swedish and Danish subsidy regimes for household owned wind power.

New results include an evaluation of the subsidy value of income and VAT tax breaks available to investors, and a demonstration of the importance of the choice of ownership arrangements for the profitability of wind power projects.

The study outlines the complex restrictions associated with different forms of wind power ownership. These cause the investment market to be highly segmented.

The discussion includes several irrational system effects of the subsidy regimes. Among these are collision with energy saving goals, excessive capital costs, dubious siting decisions, and distorted competition among technologies.

In conclusion, some policy recommendations are suggested.

3. INTRODUCTION.

Throughout this century, cheap and plentiful energy was a policy goal for most nations. Only the last twenty years has seen some departures from this goal, particularly in Western Europe and Japan.

Tax breaks and other forms of subsidy were often implemented to support the goal. Tax breaks have mostly targeted the investment process, often through favorable depreciation rules established for specific types of energy production. At the same time, special taxes have been levied on some types of energy consumption, such as fuels for automobiles or electric power for households. The traditional reasons for such taxes have not been energy policy, but fiscal rationality, such as low price elasticity, easy administration, or redistributive justice. In the last two decades, however, energy policy has also become an important reason for such taxes.

This amounts to a somewhat paradoxical situation, where energy is simultaneously taxed and subsidized. In theory, the combination of high consumption taxes with investment subsidies and tax breaks, if carefully planned and implemented, might constitute a powerful set of policy instruments, which in a market setting could transform the energy system in desired directions. But in real life, complex combinations of taxes and tax breaks, decided in different circumstances, by different political coalitions, and for different purposes, may equally well lead the energy system astray, away from economic as well as environmental goals.

This article analyzes and discusses incentives inherent in the Swedish and Danish subsidy regimes for wind power.

Swedish wind power has been taking off in recent years, and now include some 160 mills with an installed capacity of 40 MW. Danish wind power has reached a more mature stage with some 3600 mills totalling 510 MW.

4. METHOD.

Starting from interviews and trade literature, prevalent ownership arrangements for wind power were identified. One Danish and three Swedish household ownership arrangements were selected for close scrutiny. A preliminary understanding of each arrangement was developed from the same basis, and from analysis of several investor prospects. Such preliminary understanding, including issues of association law, tax rules, and power law and regulations, was checked, supplemented and refined by confrontation with legal documents and literature.

Rules thus identified were incorporated in a spreadsheet model, accounting for life time project cash flows, contingent on ownership arrangement, national law, and a number of technical and economic parameters, several of which are listed in Appendix 1. Testing of the model included its ability to reproduce calculations from investor prospects and identification of causes for discrepancies.

The model was used to quantify subsidies, particularly differences in tax breaks amongst ownership arrangements and between nations. Results are presented in this article mainly as post subsidy production costs per kWh, as this is the most relevant figure for competition among suppliers to the grid.
The model supports alternative presentation formats, such as the internal rate of return or present value of the project, based on an exogenous power price.

Important parameters are listed in the notes1. For non-financial costs and technical parameters a compromise was attempted between conservative engineering estimates from Morthorst et al. (1991 & 1994) and optimistic estimates from entrepreneurs and equipment producers. The author has freely defined normatives for returns to investors and parameters for inflation.

5. POWER PRICE STRUCTURE.

In Denmark as well as Sweden, wind power investments are made chiefly by private households for their own consumption. A commercial price structure for household power is illustrated in Table 1. A comparable price structure for household wind power is presented in Table 2.

Table 1: Typical 1995 price structures for household power.2

mECU/kWh	*Sweden*	*Denmark*
Production and transmission	26	34
Distribution	10	10
Energy taxes	10	58
VAT	12	25
consumer price	58	127
excise taxes / pre-tax price	59 %	188 %

Table 2: Cost and subsidy scenarios for wind power in the most favored household ownership arrangement3. 1995 figures.

mECU/kWh	*Sweden*	*Denmark*
Productions costs		
Initial investment	24	24
Operation, maintenance and renovation	14	14
Non-financial production costs	38	38
6 % net returns to investor	17	17
Corporate and personal income tax[4]	12	15
Cost of capital	29	32
Total production costs	67	70
Value of production subsidies		
Investment subsidy[5]	-15	none
Rebate on distribution costs[6]	none	-3
Refund of energy taxes	-10	-36
Income tax breaks	-12	-15
Value added tax (VAT) breaks[7]	-3	none
Total subsidies	-40	-54
Post-subsidy production costs	27	15
Standard distribution and excise charges		
Distribution	10	10
Energy taxes	10	58
VAT[8]	12	25
Consumer price	59	108

6. SUBSIDY RATIONALITY.

It is evident from Table 2, that subsidies are high in Sweden as well as Denmark. In Denmark they roughly compensate the heavy taxation of household power. In Sweden they amount to a substantial net subsidy.

Do these favors for wind power then drive energy investments in a direction, that makes sense from an environmental and economic perspective? This question may be posed at three different levels:

1.The balance between production and saving of energy.
2.The choice among different technologies for energy production.
3.The details of wind power investment.

The research findings presented in this article relates mainly to item 3. A brief discussion of item 1 and 2 should however establish the proper context.

6.1 Balance between production and saving of energy.

On environmental as well as economic grounds, it can be argued that energy savings should be the first priority of energy policy.

The environmental argument would be, that all energy production has negative environmental impacts, and that opportunities for low-impact productions are limited. Low-impact technologies should be used to phase out high-impact technologies, rather than increase total energy production.

The economic argument would be market failures. On the supply side, negative externalities are abundant. On the demand side, transparency and opportunity for rational choice are often lacking, as the consumer is unaware of energy costs or lack insight or incentive to react to these costs. Policies that provide incentives for savings and disincentives for production, could be seen as efforts to compensate such market failures.

If such arguments are accepted, any kind of subsidy or tax break for energy production is suspect. Renewables should be taxed, not subsidized. Coal should obviously be taxed much more.

A household may well face a choice between a wind power investment and an energy savings investment. An incentive for wind power is simultaniously an incentive against using the same money for a savings investment. Furthermore, several of the subsidies for wind power depends on the households own level of consumption. The more power it consumes, the more subsidy is it eligible for.

Neither Swedish nor Danish figures in Table 2 reflect any significant priority for savings. Table 3 spells this out by comparing the net taxation of wind power consumption with the taxation of energy saving types of consumption (such as buying a warm sweater or a bike) or fairly neutral types of consumption (such as buying a compact disc or having a hair cut).

Table 3: Net taxation af wind power consumption.

mECU/kWh	*Sweden*	*Denmark*
excise charges (energy taxes & VAT)	22	83
subsidies	-40	-54
net taxation	-18	29
net taxation / un-subsidized production costs		
wind power	-27 %	41 %
standard goods and services (VAT only)	25 %	25 %
net premium for wind power consumption, compared to other consumption	52 %	-16 %

The Swedish figures indicate a significant social preference for increased energy production, rather than savings, if only the technology used is wind power. The production and consumption of wind power gets a 52 % net subsidy, a level otherwise reserved for kindergartens, museums and similar worthy causes. The problem is of course, that low Swedish general energy taxes simply do not leave room for strong incentives to renewables without contradicting priority for savings. The Danish situation is somewhat better, in so much as the general energy taxes are so high, that wind power need not receive a net subsidy. But even in Denmark, a surcharge of 16 % on wind power reflects no strong priority for savings or for energy-lean forms of consumption, and thus no visible acceptance of the above arguments for savings priority.

Against such theoretical grumbling, a pragmatic person might object that higher general energy taxes are no realistic political option. Therefore, subsidy for low-impact technologies must be pursued as a second-best approach. This could be true. But support for renewables might equally well turn out to be a policy that helps keep the energy system locked into the present overproduction/overconsumption paradigm.

6.2. Choice among different technologies.

Several technologies for energy production have the potential to reduce the environmental impact of the energy system. In this respect, wind power may well be challenged by other renewables, such as biomass, hydro and solar. Challenge may also come from conversions to natural gas from other fossil fuels, and from more efficient use of coal.

Without careful design, tax breaks and subsidies do not create a level playing field, where these technologies may compete on basis of environmental virtue and economic cost. But careful design is not the rule of politics. Subsidies and tax breaks are often implemented haphazardly, as result of political fascination with a particular technology, as reaction to efficient lobbying, or in support of local or regional development efforts, that are not really related to energy policy. Tax breaks often originate through a combination of entrepreneurial ingenuity and political non-decision.

For a Swedish illustration of this, one may contrast the alternatives of wind power and renovation of small hydro plants. Sweden has numerous small privately owned hydro plants displaying ancient technology, often in a bad state of maintenance. Renovation could often ameliorate the river environment, even with significant increase of power output. But this is perhaps an effort too unglamorous for subsidy. Such small scale hydro renovation gets little of the support available for wind power. Consequently, next to nothing is happening in this field, while wind power in Sweden approaches exponential growth, with a doubling time of less than two years.

In fact, Danish and Swedish wind power programmes have been criticized as examples of undue fascination with a particular technology. Bentzen (1992) reckons that a significantly higher price is paid for avoided CO2 emission in the Danish wind power programme, than is accepted for alternative means of CO2 mitigation, such as use of biomass. He deplores the fact, that policy is not based on such rational comparisons. A group at CGM Rationell Planering AB (1993) concludes, that with one exception (public acceptance of new energy technology) the Swedish wind power subsidy does not promote any of the policy goals, for which it is was officially implemented.

The issue here is not, whether this is a fair criticism of wind power policy. It has been challenged by other researchers (Lund 1992; Hedvall, Steen & Stenström 1993). The very debate illustrates however a major problem of technology specific implementation support: It stimulates a process, where the principal competition between technologies is not in the market, but in academic, bureaucratic and political discourse.

6.3 Details of wind power investment.

Subsidies and tax breaks for wind power in Sweden and Denmark are much more complex than appears directly from Table 2. The favors bestowed on a particular wind power investment depends on the ownership form that is chosen, and on details of the owners personal economy and power consumption. The most common ownership arrangements are described in Table 4. The choice again depends on several types of restrictions associated with each arrangement. The restrictions are outlined in Table 5.

Table 4: Swedish and Danish ownership arrangements for wind power.

Equity based joint stock:
This is the basic form of a joint stock operation, where all capital provided by the owners are in the form of equity. For the purposes of this article, Scandinavian law corresponds to common EU standards of company law. This arrangement is mentioned only as a reference. It is not actually employed for wind power investments in Sweden and Denmark.

Loan based joint stock:
This is the same legal form as above, but deployed in a non-standard way to maximize tax benefits. The "shares" in the project consist of a fixed combination of equity and loan, with the equity share small and the loan share large. The loan terms are extraordinary, with contingent amortisation and interest payment. In this way, the cash flow from the project may for several years be distributed not as double-taxed dividends, but as single-taxed interest or as tax-free loan amortisation.

Landowners commune:
This is a non-standard legal form. It is a modern elaboration by Swedish legislators on an ancient form of communal ownership (in Swedish: samfällighet), traditionally employed for such objects as grazing or fishing rights. Using this arrangement, a wind mill is seen as a shared assessory for several titles of land, analogous to a shared road or a childrens play ground. The wind mill share is registered to these titles of land. When the land is sold, the wind mill share automatically follows the land, not the owner. The basic rules of the arrangement do not require any specific proximity between the wind mill and the land, nor between the several pieces of land. Mostly however, is it deployed within a local area.

Captive cooperative:
The consumers cooperative is well established in many countries, even if there has been little legal standardization. For Swedish wind power investments, it is however deployed in a highly unusual form. A local utility with monopoly on power distribution assists customers with the formation of a wind power cooperative. The cooperative is captive in the sense, that power can only be distributed through the grid of this one local utility, and thereby also in the sense, that owners must stay in the area and consume their share of power through the utility. The arrangement is also unusual because it is in fact a capital based association, contrary to the traditional understanding of cooperatives as associations of either consumers or producers, as opposed to capital investors. Through ingenious legal construction, it is however allowed to enjoy tax benefits, which have been designed for consumer cooperatives.

Partnership:
This is the basic common law form of joint ownership. In Denmark, it is the predominant arrangement for household wind power. Partnership production of power consumed in private households by the owners is treated by Danish income tax law as a non-commercial activity, free of income tax. Swedish tax law always requires a partnership to deal with its owners on commercial terms and be taxed accordingly. This makes the arrangement irrelevant for Swedish wind power.

Table 5. Restrictions associated with different ownership arrangements

legal form	**normal joint stock**	**landowners commune**	**partnership**	**captive cooperative**
country where used	*Sweden*	*Sweden*	*Denmark*	*Sweden*
geographical restrictions				
wind mill location	none	none	none	in an area where the local utility wants to cooperate *(power law)*
owners location	none	none	in the same local government district as wind mill, or neighboring district *(power law)*	in the same utility area *(power & VAT law)*
restrictions on owners type of housing	none	separate house on own land *(income tax & real estate law)*	separate household *(power law)*	separate power meter *(utility requirement)*
restrictions related to owners power consumption	none	*physical terms:* production must not exceed yearly consumption *(income tax & VAT law)*	*monetary terms:* sales revenues must over several years not significantly exceed power expenses *(power & income tax law)*	*physical terms:* production must not exceed yearly consumption *(income tax & VAT law)*
restrictions on trade in shares	none	tied to trade of real estate *(real estate law)*	only to other qualified owners	only to other qualified owners

Actually, only one arrangement is widely used in Denmark. It has been developed bottom-up by local wind power fans, trying to use existing power, tax and association law to their best advantage. Through the years, by effective lobbying, they have achieved changes of power and tax law that further accommodates and enables the typical ownership arrangement. At the same time, restrictions have been made more precise. Thus, a combination of bottom-up initiatives and top-down responses, have carved out one particular favored ownership form.

This ownership arrangement, and the concomitant restrictions, clearly (and intentionally) promotes a specific ownership pattern, which is local, small scale and cooperative. On this basis, a wide distribution of ownership has been achieved. Some 50.000 Danish households, mostly rural or semi-rural, are partners in a wind mill. For the expansion of wind power, this has been an advantageous regime, because it has created a large, organized constituency for wind power politics. It has also worked against some negative images, such as "capitalist speculation", or "outsiders spoiling the landscape". On the other hand, the regime has limited the financial resources available for wind power projects. Wind power has not been allowed to connect to standard financial markets, nor to great numbers of potential urban investors.

The Swedish picture is more complex. Here, the development of ownership arrangements has also been bottom-up, i.e. a process of utilizing and trying to stretch pre-existing legal possibilities. This activity has not met with much top-down response. No specific ownership arrangement has received top-down blessing and support through accommodating legislation. The Swedish scene is thus more chaotic, but also more flexible. It is chaotic in the sense, that restrictions on different ownership arrangements have not been designed by anybody, but have just happened, as consequence of rationalities quite outside the field of wind power policy. It is chaotic also in the sense, that the individual investor must face a market of bewildering diversity. It is flexible in the sense, that suitable arrangements are available also for the metropolitan denizen, for the investor without long-term stable residence, and for the large scale or even speculative investor. This is a flexibility of choice between arrangements, not a flexibility of the individual arrangement. Each arrangement type has its peculiar complex of limitations, and available tax breaks are tied to distinctive aspects of the arrangement chosen and specific demands on the investors consumption and private economy.

The choice of ownership arrangement has great influence on production costs, as shown in *Table 6.*

Table 6: Post-subsidy productions costs for the same technical project1, in different Swedish ownership arrangements.

	mECU/kWh
Loan based joint stock:	38
Landowners commune:	30
Captive cooperative:	27

Such differences in productions costs translate into certain effects on the deployment of wind power. The effects are here discussed from two different perspectives:

1. Inefficient siting of wind power.
2. Shortage of financial resources.

6.3.1 Inefficient siting of wind power.

To suit technical and socio-economic criteria of efficiency, wind mills should be sited where the wind is strongest, with some compromise to avoid excessive costs for grid connection and transmission, and to avoid nuisance to other land use interests.

Tax breaks however tend to drive wind mills towards other sites. They put a premium upon locations close to investors. A hard incentive is the legal demand for proximity, which is inherent in the Danish partnership and the Swedish captive cooperative. Softer but quite effective incentives are induced by rules that limit the size of individual shares and thus force the combination of a large number of small scale owners. This promotes a community oriented investment pattern, where the wind mill and the investors are located in the same area.

An illustration of siting incentives are provided in Table 7. This table compares some investment alternatives available to a household in the city of Lund, Sweden. The comparison is based on real life investment proposals, which were recalculated to allow this direct comparison.9 Not all incentive for good siting has been eliminated, but it certainly has been much reduced. From the viewpoint of a small investor, there is no economic temptation to choose anything but a local project, regardless of wind.

Table 7. Alternative wind mill locations and ownership arrangements for investor with residence in Lund, Sweden

production per year	example of location	production costs, post subsidy, mECU/kWh		
		joint stock company	landowners commune	captive cooperative
1 080 MWh	Baltic islands	**33**	27	not legal
1 026 MWh	good coastal location	36	**28**	not legal
972 MWh	coast near Lund	43	35	9
879 MWh	entry to Lund	43	35	**31**

6.3.2 Shortage of financial resources.

Contemporary financial markets are deep. In recent years they were able to finance large privatizations and huge government debt. They could provide any amount of capital wanted for wind power, if such investments were perceived as profitable. The mid-1980ies California wind power bubble gave a taste of this.

Scandinavia has avoided repetition of Californian experience, by having doors shut close between wind power and standard financial markets, as consequence of the restrictions outlined i Table 5. Other sources of finance were relied on. Utilities were coerced to build some wind mills, particularly in Denmark. A more important source was household finance. Capital was raised directly from households, each typically contributing a minimum of some 400-500 ECU, and seldom exceeding a soft maximum of some 5000 ECU.

Deployment of wind power thus was made dependent on a non-standard financial market with inherent limitations. The ability of households to provide this kind of finance is limited by several circumstances. Household wealth is mostly bound in home ownership and pension schemes. Wealth and particularly free financial resources are unevenly distributed, and many eligible households lack the means to invest, while others have large capacity for investment, but are only eligible for a token share of wind power.
Wind power investments may not have the liquidity wanted by households, nor the time and risk profile preferred. It is not easy for households to evaluate wind power projects, and such involvements may even be felt to transgress economic prudence.

These inherent limitations of household finance are further acerbated by wind power rules. To get maximum subsidies (Sweden) or even to be allowed to invest (Denmark), households have to be located where acceptable wind sites are available. They should have no intention of moving any great distance. They must be aware the their children are only allowed to inherit the shares if they live in the same area. They must be certain that they will maintain for many years the ability to consume the power, they are signing up for. If any of these conditions are broken they must be prepared for the hardship of selling shares of uncertain value in an illiquid market.

Such limitations can easily cause a shortage of capital for wind power projects. In some regions of Denmark, entrepreneurs report severe difficulties in raising capital, even in the face of positive local response, because a large proportion of eligible households have already invested to the limits. In Sweden there is no such saturation, but entrepreneurs do report paradoxical situations where initially succesful projects are cancelled or greatly delayed because not quite enough local investors sign up, while outside investors have insufficient incentive to join, or may not even be allowed to do so.

In such circumstances, the cost of capital for wind power must be expected to be significantly higher than the general market price of capital. Capital cannot flow freely to wind power projects, as it can to competing technologies and organizations, such as fossil fuel plants commissioned by utilities. If household investors are rational in the economic textbook sense, they must demand a premium on wind power profits to compensate for the lack of liquidity and the concentration of risk, which they must accept as a consequence of market segmentation caused by restrictive wind power rules. They may surely choose to demand no such premium, for idealistic reasons, but then they are really

donating their own private subsidy to wind power, on top of what the state provides. Such idealism may certainly shake the conservatism of established power producers, but it can hardly take windpower into the mainstream of contemporary energy investment.

Wind power is thus made more costly by restrictions on ownership. Wind power policies risk getting caught in a vicious circle:

1. The non-financial productions costs are too high to make wind power competitive.
2. Consequently, to promote wind power subsidies are introduced, increased or simply accepted (tax break constructions developed bottom-up).
3. To prevent "misuse" of subsidies, they are tied to ownership restrictions.
4. Ownership restrictions segment the market and increase the cost of capital for wind power.
5. High capital costs further decrease the pre-subsidy competitiveness of wind power.
6. Return to point 2 for a new round ...

7. CONCLUSIONS.

Wind power in Sweden and Denmark is highly subsidized through a broad range of favors, including tax breaks associated with household ownership. At the present Danish level of subsidy, wind power can certainly compete with other energy technologies, if it is allowed access to capital and good quality sites.
In Sweden wind power can compete with existing capacity if investors are willing to bet on good durability of present wind technology.

The article does not argue, that the present level of subsidy is excessive, but does demonstrate several irrational complications regarding the implementation and the interaction with other policy goals.

The implementation regime restricts the flow of capital to wind power projects and should be expected to increase costs of capital, or even foster shortages of capital. The regime reduces options and incentives for good siting.

Being partly tied to a particular technology and to distinct ownership arrangements, the subsidy is not consistent with a desire to create a level playing field for competition among technologies and organization forms to reduce environmental impacts of energy production.

The subsidy is not consistent with a priority for energy savings over energy production.

8. POLICY RECOMMENDATIONS.

1. Segmentation of the household market for wind power investments should be radically reduced, in order to decrease capital costs, prevent capital shortages, and establish more effective competition among wind power projects.

2. Ties should be avoided between subsidy and the investors own consumption of power, in order that incentives for energy savings are not compromised.

3. The reasons for maintaining barriers against commercial wind power should be reconsidered, and the costs and benefits of such barriers should be carefully evaluated.

4. Specific wind power subsidies should give way to a regime of more general subsidies, that depend directly on environmental benefits, rather than favor particular technologies.

5. General energy taxes must be substantially increased, to create room for subsidy to low-impact energy production, while maintaining a significant priority for energy savings.

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10. NOTES TO TEXT AND TABLES.

1. Wind project parameters employed in the article are listed here. Information in parentheses refers to Morthorst et al. (1994) for comparison.
   Base year: Spring 1995 (Autumn 1993)
   Installed capacity: 450 kW (ibid.).
   Production: 977 MWh/year, when not otherwise stated in tables. This corresponds to an average Danish siting.
   Initial investment, installed and connected to grid: 471 (451) MECU, net VAT. Operating life: 20 (15) years.
   Operation, insurance and maintenance, stated as yearly percentage of initial investment. In real terms. Years 1-2: 1,0%. Years 3-5: 2,0%. Years 6-10: 2,4%. Years 11-15: 2,6%. Years 16-20: 3,0%. (Ibid., except for years 16-20).
   Renovation, year 11: 10% (20%) of initial investment, in real terms.
   Termination costs: none (ibid.)
   General inflation: 3% p.a.
   Post income tax, real terms, internal rate of return to investor: 6% p.a.

2. Swedish power is typically produced by hydro and nuclear, contributing roughly equal shares. Danish power is based mainly on coal. The figures compared are from two distribution companies close to the Swedish/Danish border: Lunds Energi and NESA.

3. Sweden: Captive cooperative. Denmark: Partnership. See Table 4 for ownership details and Appendix 1 for parameters.

4. A reference level for income tax must be defined, in order to evaluate tax breaks. The reference chosen is a stand alone joint stock arrangement to produce wind power for sale to non-owners, financed through a tax-optimal combination of equity and loan. For further description, see Table 4: loan based joint stock arrangement.

5. In Sweden, 35 % of the initial investment is refunded as investment subsidy. In Denmark it could be argued, that some investment subsidy is inherent in the rules for grid connection. The wind power producer pays only for connection to the nearest 10-20 kV line, regardless of the capacity of this line. Beyond that point, all costs for grid improvement is paid by the distribution company (Bekendtgørelse om tilslutning..., 1992). In Sweden it is recommended, that distribution companies charge wind power plants for all investments caused by their integration in the grid (EKOVISAM 89, 1989).

6. Danish distribution companies are obliged by law to pay for wind power at a fixed rate of 85% of their own consumer price, net taxes (Lovbekendtgørelse om udnyttelse..., 1992). The wind power producer thus pays 15% for the service of distribution. This is less than standard distribution costs charged to consumers. The difference is here interpreted as a subsidy to wind power. This ensures comparability between Danish and Swedish figures. It should not be understood as an attempt to estimate the true subsidy value of the grid connection regime, which is a complicated issue.

7. This item reflects the subsidy value of deferred VAT payment. The VAT system is not neutral in regard to ownership arrangements.

8. VAT is the same figures as in Table 1. The power cannot be transmitted as cheap power. The lower price comes out through additional returns from the project, above the normative used in calculation. The connection between this income and a specific consumption is accepted as grounds for exemption from income tax, but not from VAT. The only exception is the captive cooperative arrangement, where a VAT break arises, being treated here as a subsidy.

9. All parameters have been made identical, except tax breaks and power output.

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