



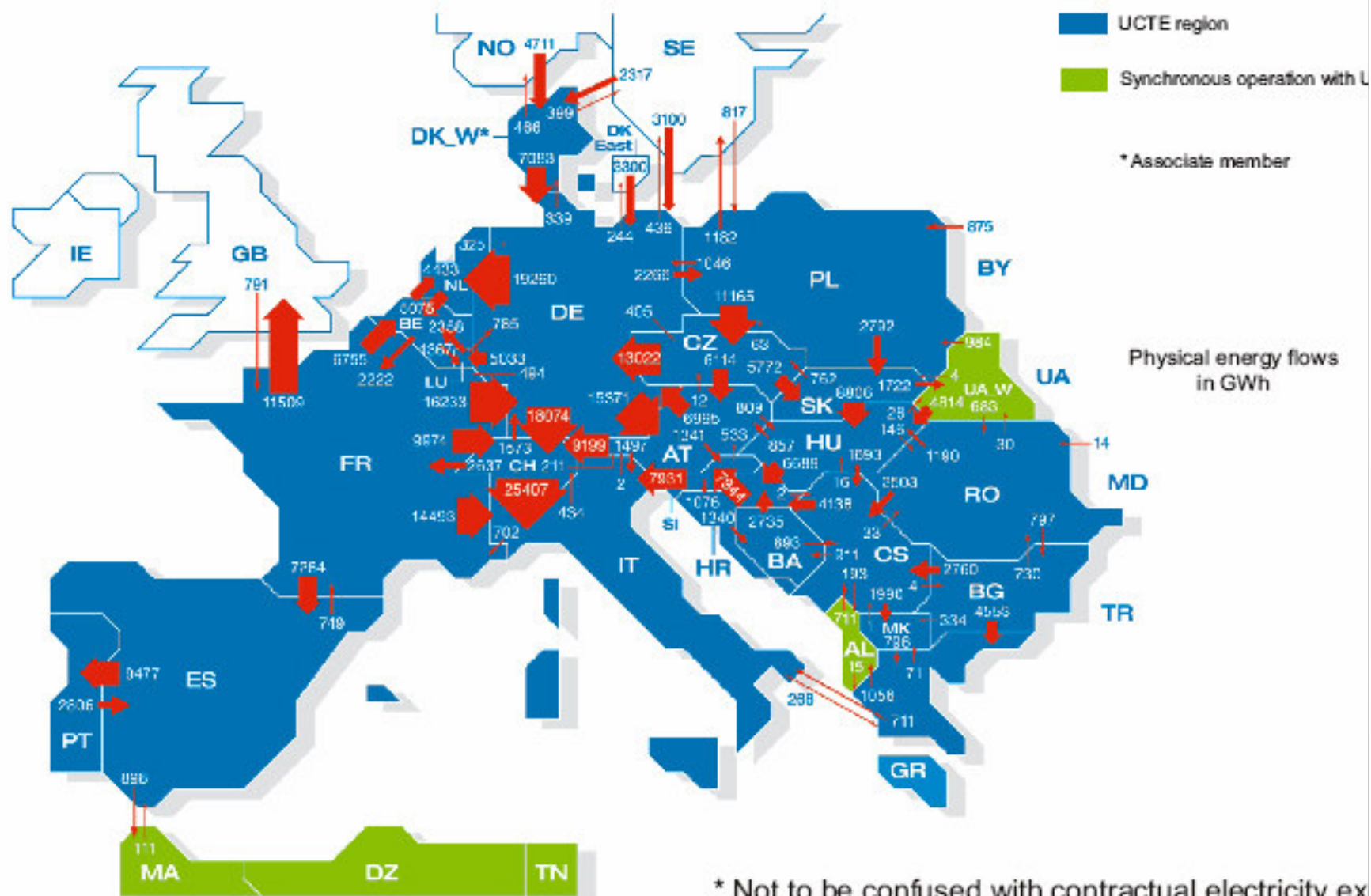
European Union decisions

In reply to requirements of the European energy market, its problems and trends of development, the European Parliament and the Council of the European Union on June 26th 2003 adopted decision no 1229/2003/EC. It states that the interconnection, interoperability and the development of Trans-European Energy Networks (TEN) shall be promoted in order to:

- encourage the effective operation of the internal energy market;
- reduce the cost of energy to the consumer;
- contribute to the diversification of energy sources;
- reinforcing the security of energy supplies;
- for the reinforcement of the security of energy supplies the strengthening of relations with third countries is to be taken into account;
- the decision applies to all none-distribution network high voltage lines and to submarine links;
- problems of bottlenecks, congestion and missing links as well as the interoperability of electricity networks within the EC with those in the accession candidate countries and other countries in Europe shall receive priority of action;
- member States of the EC are obliged to take any measures they consider necessary to facilitate and speed up the completions of projects of common interest (and in particular the necessary authorization procedures) and to minimize delays while complying with community law and international conventions on the environment.

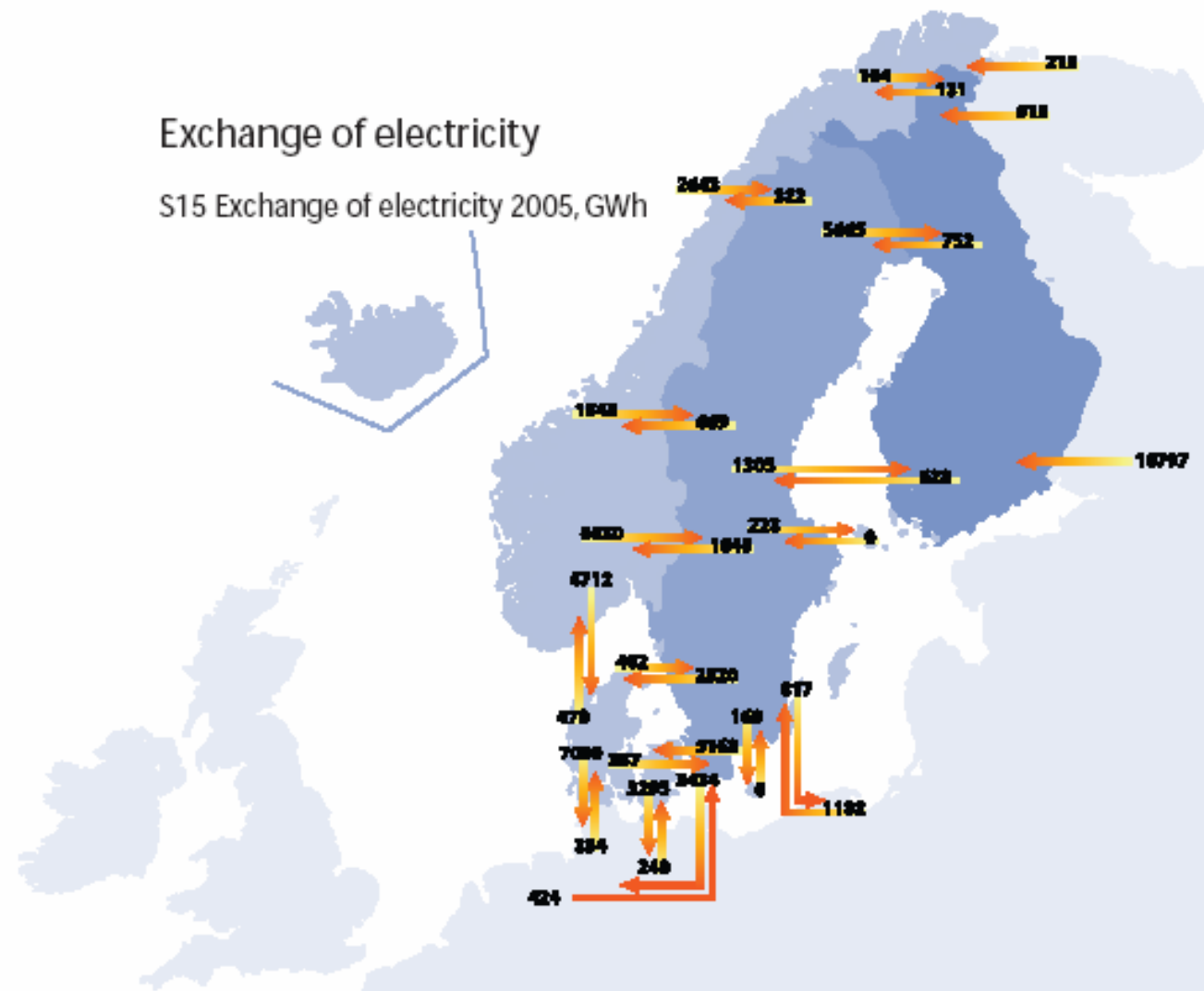


Physical electricity exchanges 2005



Exchange of electricity

S15 Exchange of electricity 2005, GWh



S16 Exchange of electricity 2005, GWh

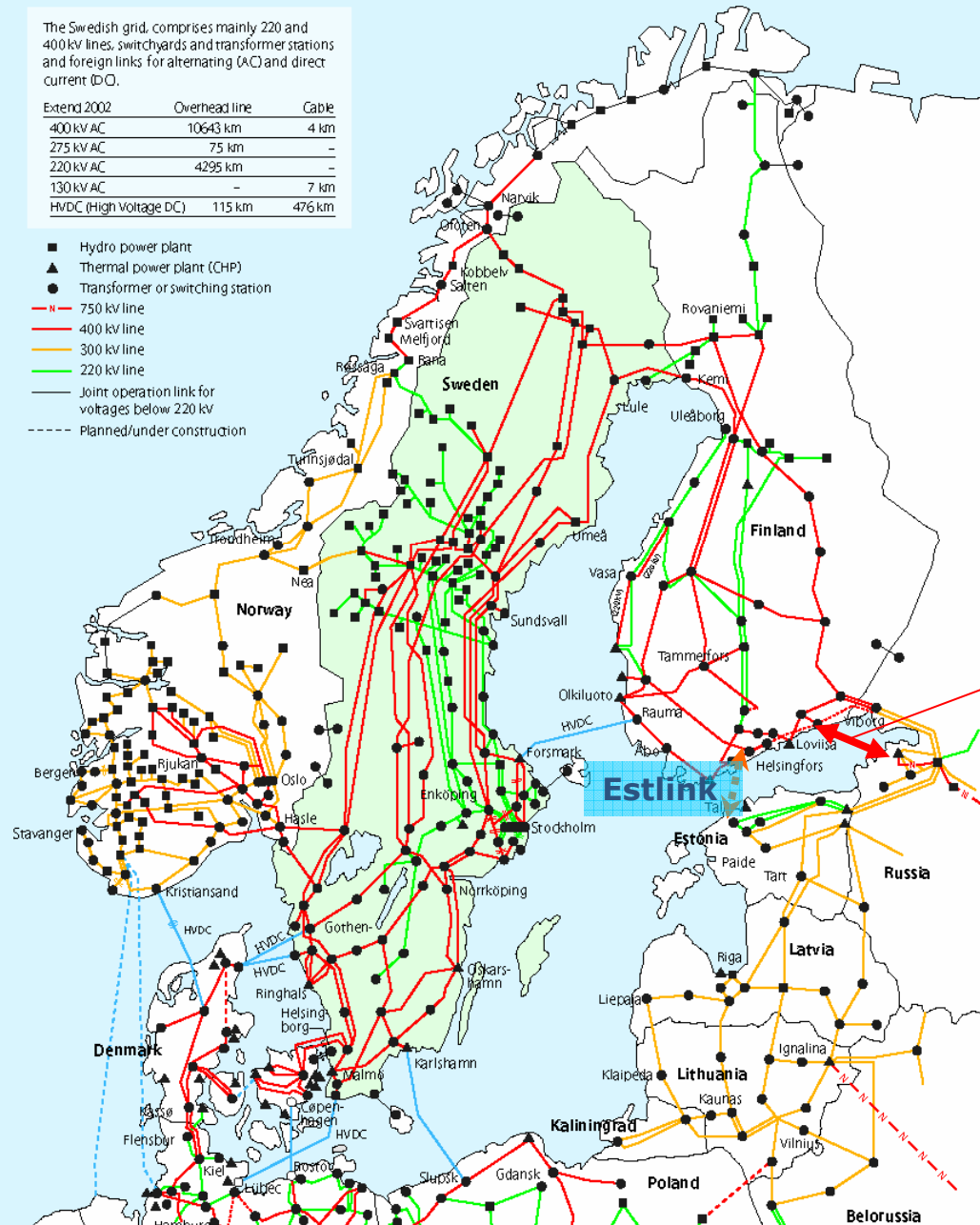
From:	To:	Denmark	Finland	Norway	Sweden	Other countries ^a	Σ From
Denmark		-	-	470	759	10,394	11,623
Finland		-	-	131	1,394	.	1,525
Norway		4,712	164	.	10,816	.	15,692
Sweden		7,692	7,193	2,836	.	4,251	21,972
Other countries ^a		594	11,312	215	1,606	.	13,727
Σ To		12,998	18,669	3,652	14,575	14,645	64,539

The power transmission network in northwestern Europe

The Swedish grid, comprises mainly 220 and 400 kV lines, switchyards and transformer stations and foreign links for alternating (AC) and direct current (DC).

Extend 2002	Overhead line	Cable
400 kV AC	10643 km	4 km
275 kV AC	75 km	-
220 kV AC	4295 km	-
130 kV AC	-	7 km
HVDC (High Voltage DC)	115 km	476 km

- Hydro power plant
- ▲ Thermal power plant (CHP)
- Transformer or switching station
- 750 kV line
- 400 kV line
- 300 kV line
- 220 kV line
- Joint operation link for voltages below 220 kV
- Planned/under construction



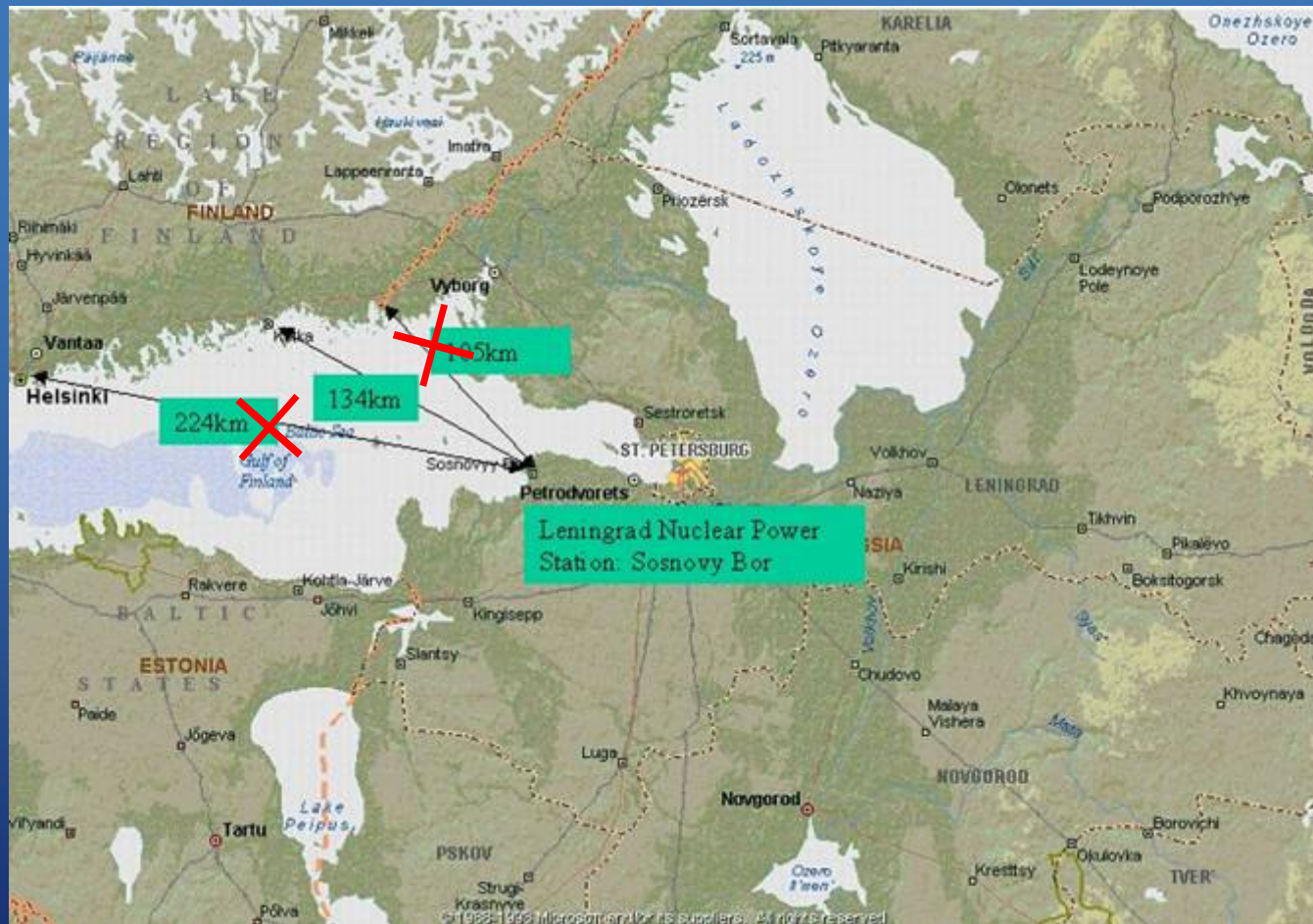
United Power

750 KV Line

+1GW (2004)

Tver (Kalinin) NPP

Alternative considerations



Connection point in Russia near LNPP OSG-750 (**Kernovo**) because:

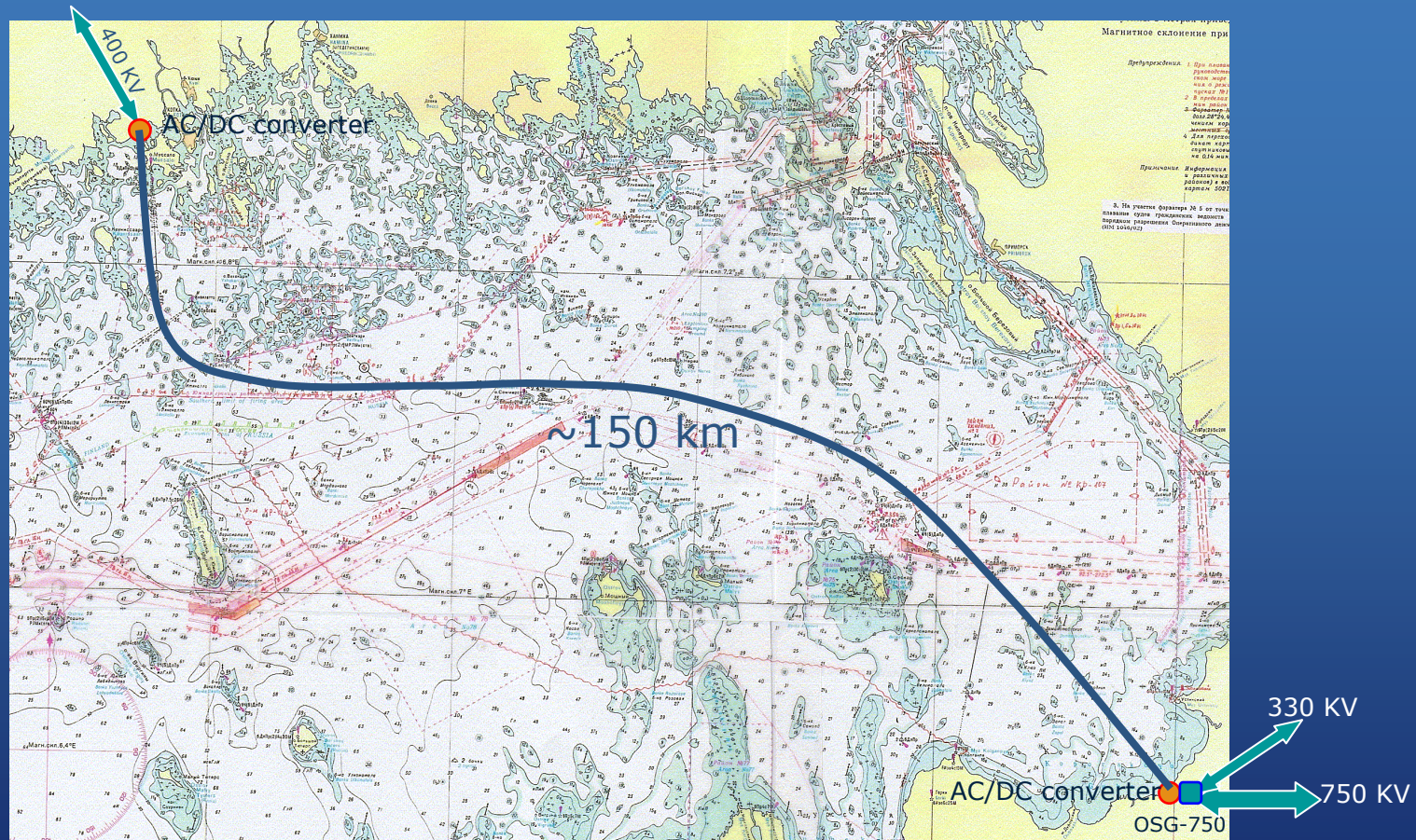
- strong interconnection to Russian grid (750KV + 2 x 330KV lines)
- high concentration of production capacities (4000 MW)
- the 750 KV open switch gear is located directly at shore (Kernovo)
- strong support from local and regional authorities

Nuclear Conference

Budapest

Dr. András Szép

The Route: Mussalo - Kernovo



Connection point in Finland is near Kotka (**Mussalo**) because:

- only 12 km to 400 KV main line of Fingrid, 50 km to Korja substation
- approved upgrade plans of existing 110 KV line to 400 KV / min.600 MW
- Kotka Energia OY is a strong partner as power producer and trader
- Municipal authorities support and principal permit to allocate necessary construction area

Nuclear Conference
Budapest

Dr. András Szép

The proposed 1000MW (2x500MW) HVDC submarine cable between Mussalo (Finland) and Kernovo (Russia):

- Brings a new independent player to the Nordic market thus increases competition and effective operation of the market;
- Competitive prices will reduce energy cost to final customers;
- Diversity of supply from Russian producers (fossil/gas, hydro, nuclear) increases overall diversity of supply;
- Additional power link to a neighboring country reinforces security and safety of supply
- Bidirectional design makes possible also export of Finnish power to Russia in case of demand (reciprocity).

Conclusion: This project fully complies with the European Union directives and decisions.

Benefits for Finland:

- Increases **quality** of life (saving of €100-200/capita/year);
- Improves **competitiveness** of base industries and so secures jobs;
- **New jobs** will be created by the investment of €300 Millions as well operation and maintenance of the cable and converter stations;
- Cheap energy will accelerate industrial and infrastructure development, investments;
- United Power Oys investment in transmission facilities is privately financed and does not increase the **transmission tariffs** but on the contrary, substantially **reduces** them for both domestic producers and customers. When **Fingrid** develops the national infrastructure, all the investment costs are covered and financed by transmission tariffs and **paid by customers.**

- It is important to have new power generation capacity available through the Finnish grid **without delay** in order to avoid deficit of electricity which is to be seen in nearest future. There has not been significant increase in power production capacity in whole Scandinavia despite consumption of electricity is increasing. On the contrary power stations have been closed down and to reopen will require substantial state subsidies.
- In Scandinavia there is enough power capacity however in dry years we face deficit of energy on annual level. Possibility to import of 1000MW on continuous basis would **save hydro power** for balancing the peak consumption and would decrease the production costs and the price of electricity paid by consumers.
- The **quickest and cheapest way** to receive additional power capacity for Finnish and Scandinavian market is to construct a cable connection 2 x 500 MW from Kernovo to Finland.

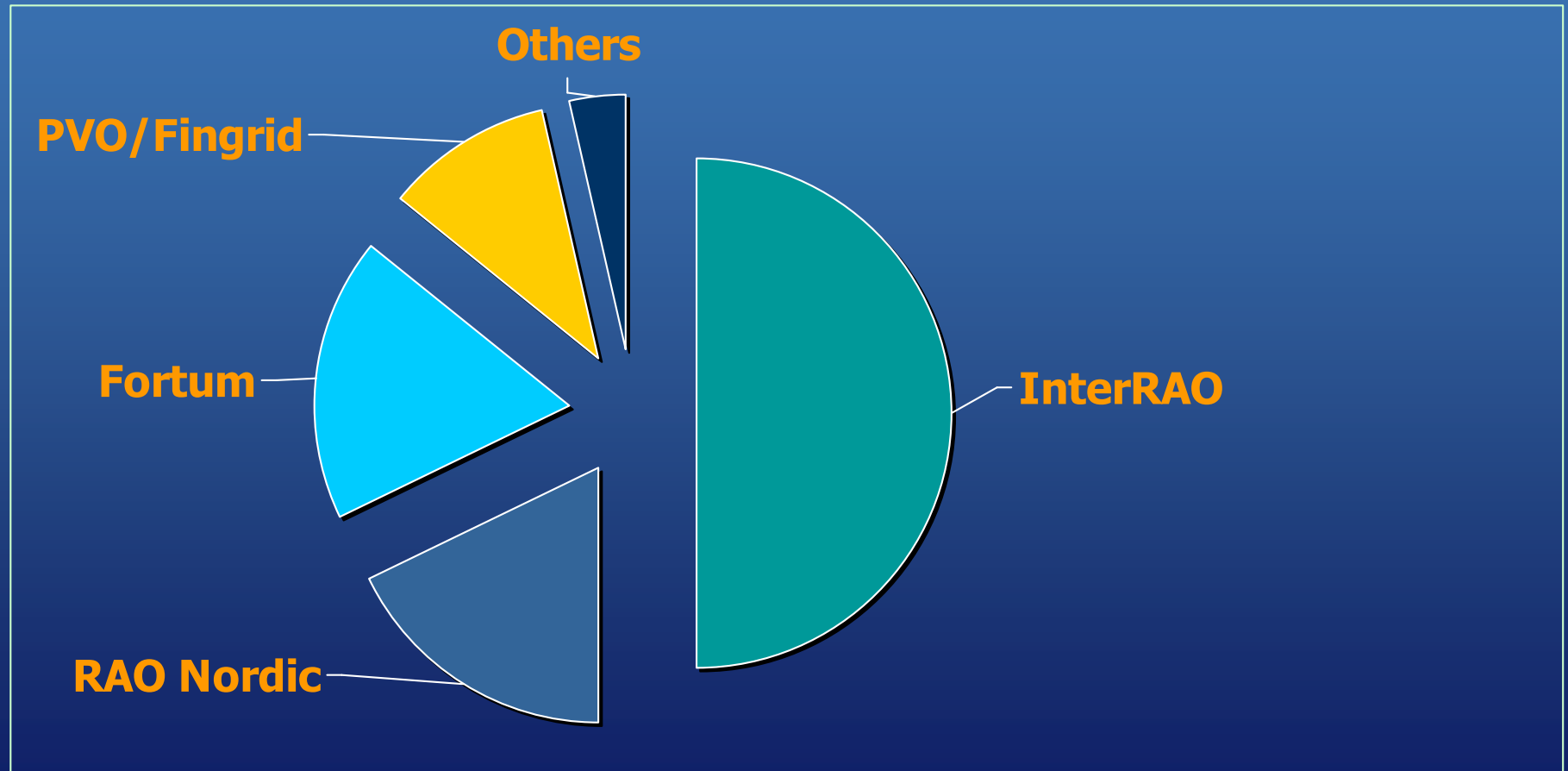
Finns and Europeans benefits from the Russian benefits too

- New well paid jobs will be created in Russia;
- Export of high-end product instead of raw materials increases export revenues of Russia and adds to the bilateral trade volume;
- Revenues from export shall be used for increasing safety of existing power plants and investment in development and construction of new technology based power plants;
- Industrial growth and economical stability in Russia serves interest of regional security of the Nordic countries.

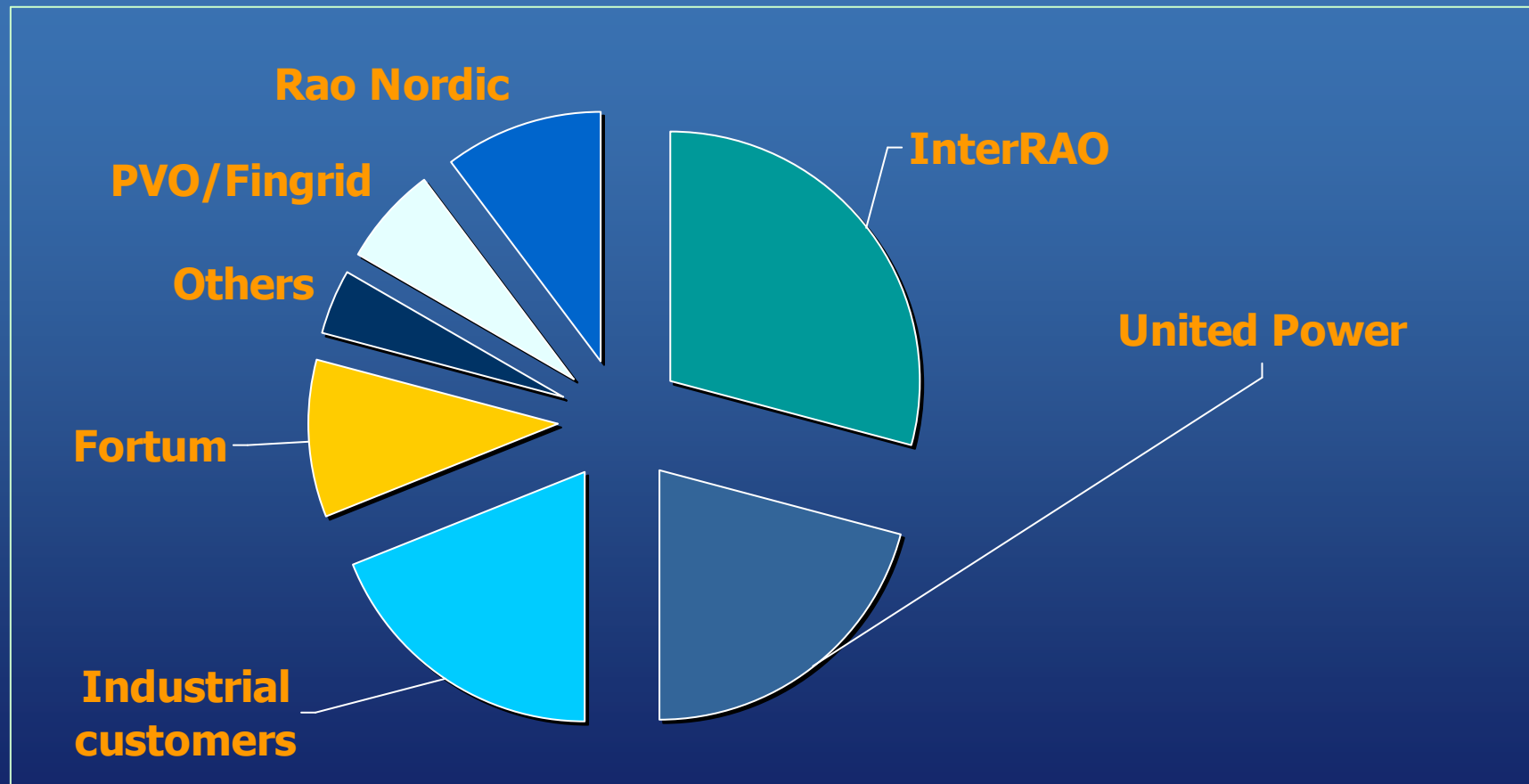
Disadvantages and counterarguments

- Political and Economical dependency of EU and particularly Finland from Russia?
- Destruction of monopolies and less corporate profits?
- Transparency and competition in international energy trade?

The cake



After the HVDC cable is in operation



This project will not make Finland dependent on imported electric energy.

Finland imports only 10% of its electric energy needs from neighboring countries. Even after implementation of the UP project Finland's self-sufficiency in electric energy will stay over 80%.

At the same time Finland imports:

- 100% of nuclear fuel (which counts to 25% of energy production);
- 100% of natural gas from Russia (11% of total energy consumption);
- 100% of crude oil and refinery products;
- as well 100% of coal;
- and less than 20% of electric power is produced from domestic hydro (17%) and alternative energy sources.

So what kind of *independence* we are talking about?

http://www.tilastokeskus.fi/tup/suoluk/suoluk_energia_en.html,

http://www.energiamarkkinavirasto.fi/files/E05-REP-01-03G_NATIONAL+REPORTS_QU-FI-V2.pdf

<http://www.eia.doe.gov/emeu/cabs/finland.html>

Fuel mix in Finland

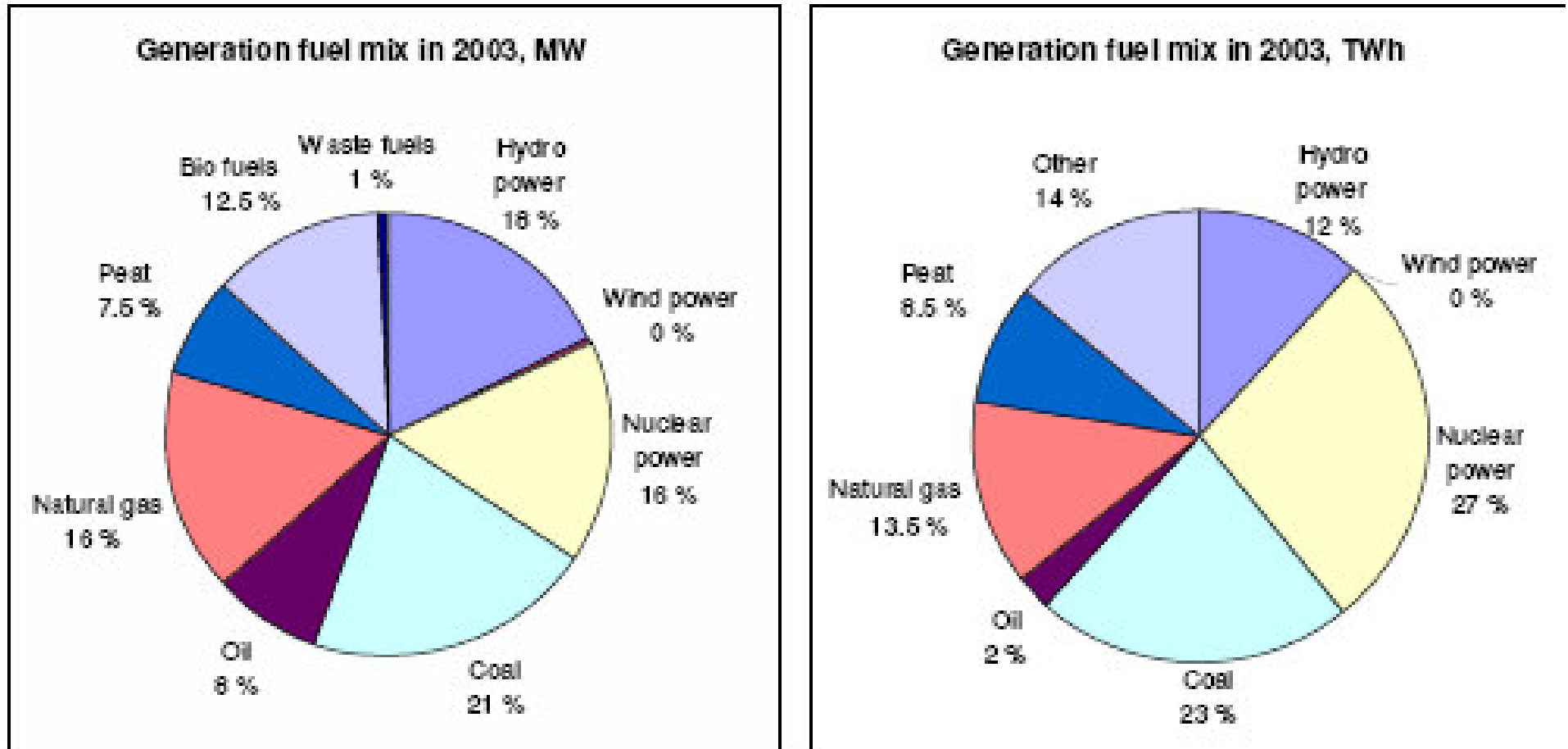


Figure 12. a) Generation fuel mix in year 2003 (MW), b) Generation fuel mix in year 2003 (TWh)

This project does completely fulfill the basic requirement for cross-border connections :

- the proposed HVDC connection is bi-directional and electricity can be transmitted to both directions;
- supply of electricity is secure and safe, the cable is connected (2 x 500 MW) to the Russian grid, which has enough capacity for this transmission and additional power capacities have been planned to construct;
- maximum deficit of supply in case of cable disturbance is 500MW and not 2400MW as Fingrid claims. It is very unlikely that simultaneous failure of the existing 1400MW connections at Viipori (of which 400MW is a direct island connection from the NWPP) and two 500 MW HVDC cable as well major failure of the NW Russian grid and simultaneous failure of 4 existing blocks at LNPP as well the two 450MW gas power plants occur.
- The Finnish grid can withstand sudden loss of 1300 MW what is much more than 500MW or even 2x500MW. At least 300MW additional loss can be compensated by load drop at certain industrial customers.
- Energy Market Authority report confirms that investment of 1.5 Billion Euros in Fingrid is needed only in case if the resistance against sudden drop shall be increased from the current 1300 MW to 2000 MW or more.

Deficit of power in NW of Russia?

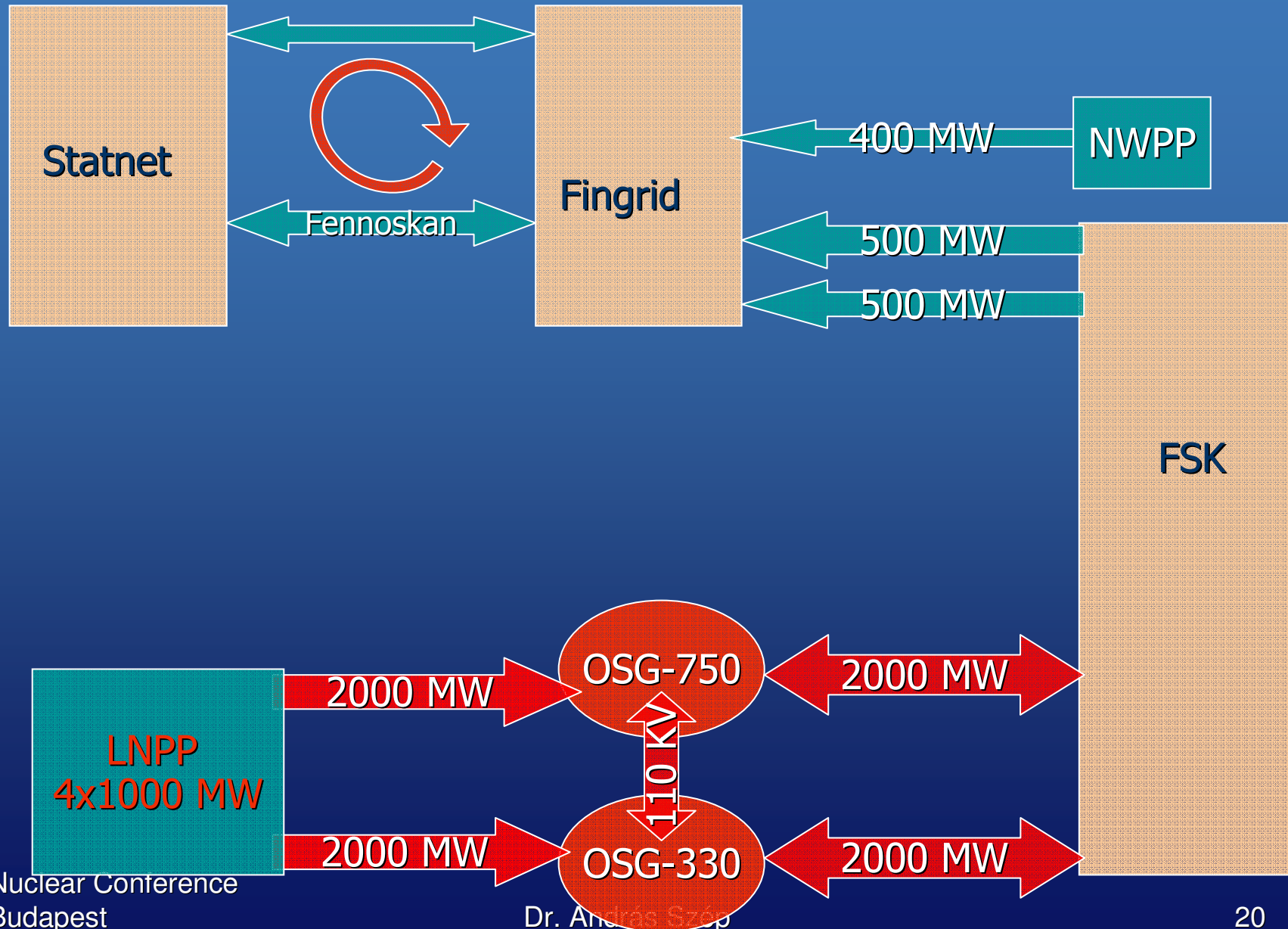
- **There are reserve capacities available even today:**
In average only about 70% of the installed capacities of LNPP (4000MW) are being used while in Finland this indicator is over 87%!
<http://www.laes.ru/ciso/work/world/razdel/statistik/bigkium.htm>, <http://www.fortum.com/document.asp?path=14022;14024;14026;14043;24939;29154;>
- 4 - 6 new nuclear blocks each with 1000-1600 MW are planned to be constructed in Leningrad region during years 2007-2017;
(<http://www.spbaep.ru/news/news.php?type=news&t=91>) and for the first 2 replacement blocks with total capacity 2300 MW the construction permit has already been granted (<http://www.minatom.ru/News/Main/view?id=33247&idChannel=73>);
- 2 x 450MW combined cycle gas turbine power plant is being constructed for balancing/security supply in Kernovo http://www.baltenergo.com/newseng/Press_26.04.06_eng.pdf;
- **TGK-1 has plans to invest 129 Billion Rubles (3.7 Billion Euros)** until 2015 to increase generation capacities by 2000 MW north of St.Petersburg and increase export by 450 MW to the existing 1400MW <http://www.tgc-1.ru/company/strategy.html>.
- Mr.Chubais has announced to invest **USD 20 Billions** in Russian power generation, transmission and distribution systems during the next 5 years.

Reliability and safety of the Russian grid and supply

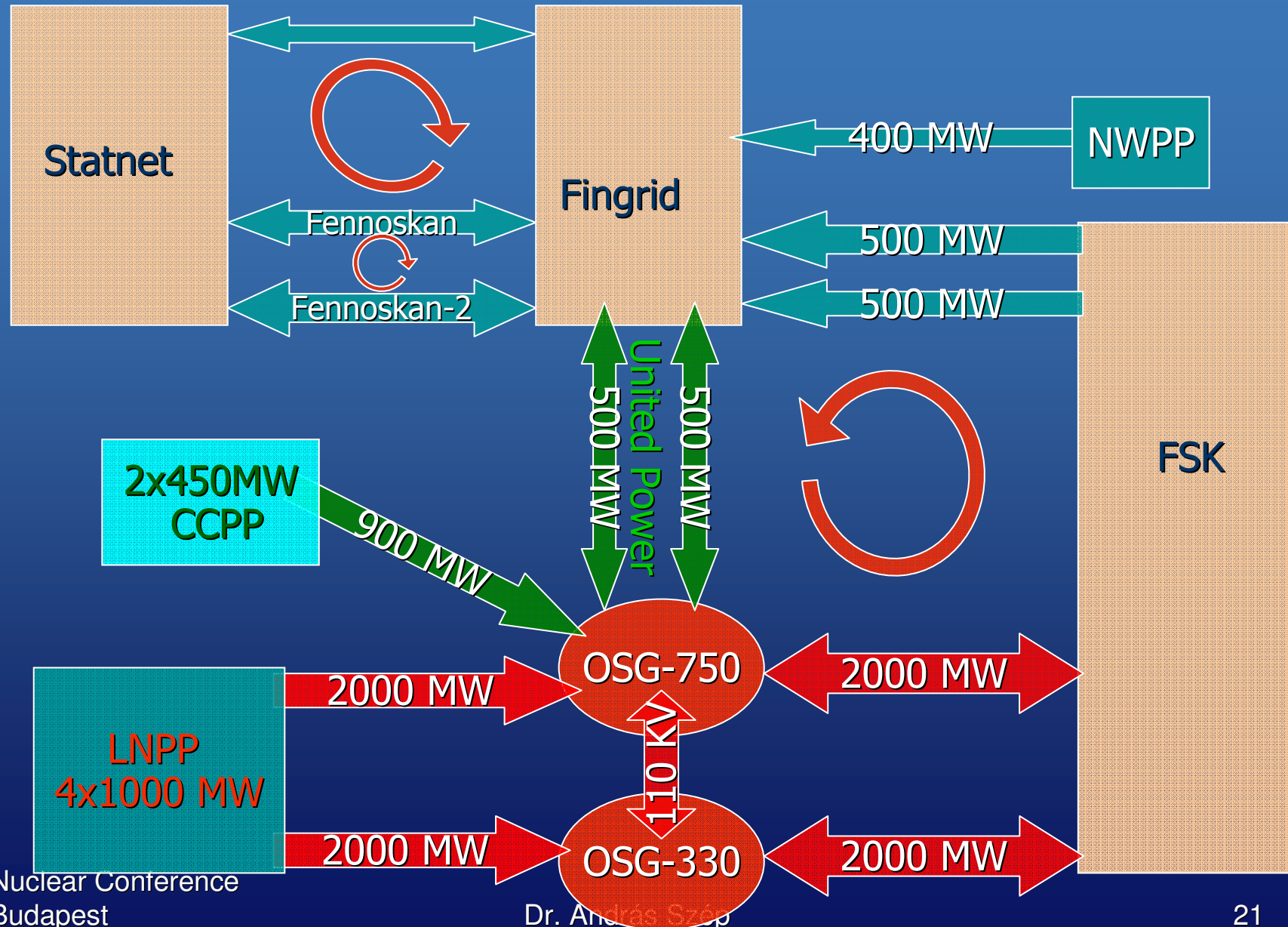
- During the last 50 years never ever a major collapse of the Russian grid had ever been recorded. Not even a substantial regional blackout happened, worst case is like the last year blackout in certain districts of Moscow due to a fire in a transformer.
- No unplanned transmission or consumption limitations has ever been recorder. Even last winter export limitation during part of the day was announced in advance.
- On the other side in the recent years we have seen major blackouts in Finland and Sweden, and even in USA, as well unannounced export cuts causing major disturbance on the market. However despite all inconveniences (darkness, transport and heating problems) none of those blackouts ever endanger human lives or lead to death because all sensitive sites (like hospitals) have autonomic emergency power backup facilities.

It would be very vague to compare reliability or safety of the Russian grid to the Nordic ones as we can mathematically prove which system is more reliable.

Security of supply and redundancy



Security of supply and redundancy



Conclusion

- Fingrid current attitude to our project in particular and ownership structure in general does not reflect interest of the people and industries of Finland more over, it contradicts EU regulations and shall be reformed to ensure equal and non-discriminatory access to all market participants to the national infrastructure.
- **Energy charter** has been signed by all EU and Russia, however Russia does not ratified it and EU countries does not comply with.
- Finland's EU presidency may give us a chance to reach our dream of **free and united Europe** without borders and limitations. Russia is part of Europe, its culture, history, economy and people. We shall promote integration of the Russian economy with EU.