

The logo for SEK, consisting of the letters 'S', 'E', and 'K' in a bold, black, serif font, enclosed within a thin black rectangular border.

**SEK**

Sustainable Financial Solutions for Investment's  
in District Heating Infrastructure and Energy  
Efficiency in Russian Cities

Recent cases studies from Russia, Ukraine,  
Romania, Riga, Helsinki and Stockholm

**Nicholas Anderson**  
Senior Vice President  
SEK Advisory Services

# SEK - Obvious partner in financial matters

SEK's mission is to secure access to financial solutions for export and infrastructure



Swedish Export Credit Corporation (SEK) provides financial solutions for export and infrastructure. SEK is an independent institution involved in lending, export credits, structured finance, capital market products and financial advisory services. SEK's head office is in Stockholm with a representative office in Helsinki. SEK is 100% owned by the Kingdom of Sweden and currently employs some 140 employees. The total balance sheet is about €25 billion.



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SEK Advisory Services is a teams of highly qualified and experienced professionals who carry out assignments individually or as a part of a project team

Provides financial advice on arranging and structuring of project finance transactions

Possesses industry expertise in several areas such as power and energy, utilities, environment, transport, telecom, and pulp and paper

Recent mandates cover projects in the energy, water, municipal utilities, environment, health, and telecom sectors

S.C. Complexul Energetic Rovinari S.A.  
Financial and Institutional Advice  
regarding  
Environmental Upgrading of  
Rovinari Power Plant



Leningrad Oblast  
Institutional Development  
Programme  
for Water and Sewerage  
Services



Rehabilitation of District Heating (DH) and Combined Heat and Power (CHP) will secure

1. operational efficiencies
2. reduce energy costs for consumers and local businesses
3. environmentally sustainable

Big impact on the living standards of the citizens

Reducing heat-related subsidies free money for education, other infrastructure and health care

Municipalities should always support the sustainable development of MHE

1. Encouraging planning for higher population density
2. DH for municipal buildings
3. strategic goals for the MHE
4. correctly priced finance for MHE investments
5. MHE must have professional managers
6. MHE must set the heat tariff - not the Mayor's job.

# Municipal Heating Enterprise (MHE)

MHE is responsible for the investments, operation, maintenance, development, financial management, billing and collection. It sets tariffs to cover fixed, operating and development costs with a reasonable profit.

The tariff is the single most important factor for the company and for the city.

MHE management need to be held responsible

A MHE can have the following forms:

1. A company 100% municipal owned Gothenburg, [www.goteborgenergi.se](http://www.goteborgenergi.se).
2. Part of a municipal holding company Leipzig and Krakow gas, electricity, water, waste, district heating, public transport [www.lvv.de](http://www.lvv.de) [www.krakow.pl](http://www.krakow.pl)
3. Third party ownership - Stockholm, 100% and Poland's (DZT), 70% owned by Fortum [www.fortum.com](http://www.fortum.com)
4. Leased to third parties - Vilnius city works with Dalkia [www.dalkia.lt](http://www.dalkia.lt)
5. Joint venture between municipalities - Copenhagen area [www.veks.dk](http://www.veks.dk)
6. Joint venture between municipal enterprises - Lithuania [www.pemfund.com](http://www.pemfund.com)
7. Joint venture between State and the municipality – Riga City & State 50/50% <http://www.randburg.com/lv/heating.html>
8. Joint venture between public and private interests for coal, biomass, gas, hydro and nuclear plants in Finland [www.pvo.fi](http://www.pvo.fi) and [www.tvo.fi](http://www.tvo.fi)

## Best practices

District heating rehabilitation is a great investment

The following best practices produce efficiency:

- MHE must own or control the heating network
- CHP plant should set the supply temperature but customers should define the water flow and the return temperature
- Correct division of the CHP costs of heat and power is crucial
- Heat and hot water meters should be owned and regulated by the MHE

MHE must have:

- Least-cost technology tools
- Installation of substations and heat metering
- Tariffs as incentives for energy conservation, advanced billing and collecting
- Corporate restructuring as a tool for creating business type operation
- Cost analysis of the MHE to identify cost leakage
- Economic analysis as a tool to assess the feasibility of investment options
- Modern preventive maintenance practices
- Corporate Social Responsibility Concept (CSRC), modern quality assurance (ISO 9000) and environmental management (ISO 14000)

# Tariffs

Heat tariffs should be based on the following six principles:

1. Full cost coverage in the way understood in Western economies
2. Cost structure reflective
3. Competitiveness
4. Incentive to cost reduction
5. Incentive to energy conservation
6. Simplicity

Consisting of two components:

1. Fixed charge covers costs of capital, permanent staff and part of maintenance
2. Variable charge covering the cost of fuel, water, electricity and heat purchase, temporary staff and remaining part of maintenance

## Price regulation

MHE should be responsible for setting tariff levels. Tariffs should be regulated either by the national regulator or allow the markets set the prices. National regulators in most European countries set clear regulations for maximum levels of fair tariffs

## Heat subsidies

Heat subsidies with heat meters reduce heat consumption by 50% to 70%. In Poland, heating costs were substantially reduced over seven years by targeting poor families through municipal support programs and by DH modernization programs. Similar results have been seen in Bulgaria and Romania.

## Financing

Investments for rehabilitation require long-term financing. Well managed funding strategies can produce significant cost savings

Funding can come from various sources, depending on the ownership and creditworthiness of the MHE. In OECD, municipal funding agencies, banks and the bond markets are main sources at near government costs

Regional government, cities and municipalities should seek to establish its own funding agencies. The Moscow Debt Office is an important example of such a funding agency

Agencies have important long term benefits for establishing better financial management of municipalities and reducing funding costs

Other sources are already available to countries in transition. Such solutions are also used in OECD countries although they are relatively marginal in nature:

1. Export Credit Agencies
2. International multilateral finance institutions IBRD, EBRD, NIB and NEFCO
3. Joint ventures with the private sector owners like Fortum, EON, Vattenfall

# Rehabilitation and modernization

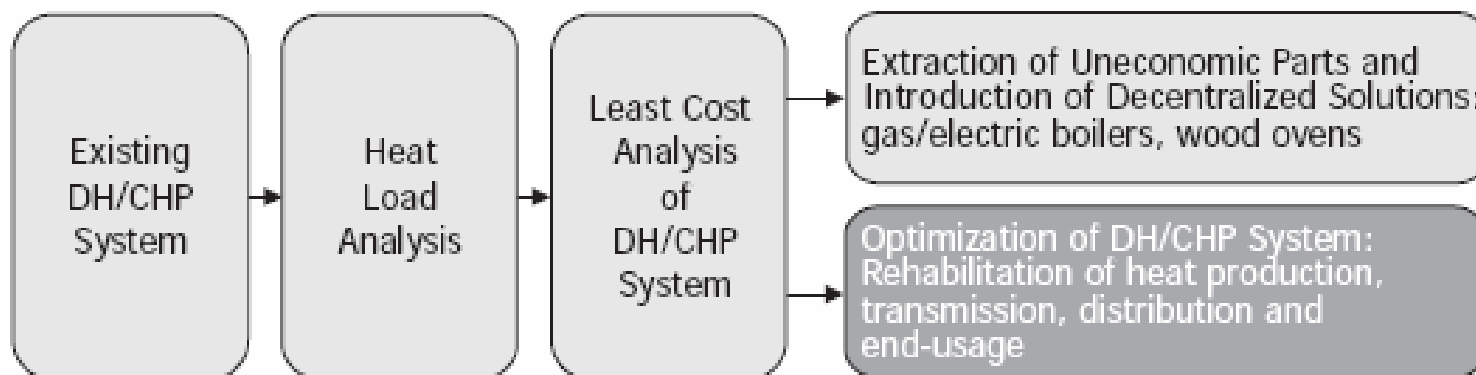
There is a huge potential for energy conservation:

1. Energy use in existing buildings is 2-3 times higher than in modern buildings
2. Energy consumption of new industry is more efficient
3. Integration of DH with CHP will reduce energy consumption

Steam distribution networks must be phased out - as in Poland and Germany

Rehabilitation results in 50% fall in fuel consumption. This is a major saving for the municipality (subsidies), the MHE (fuel costs) and their clients (tariff)

Threes phases of Rehabilitation:



Economic Analysis of the project that considers the results of the project for the community level

Financial Analysis considers the project on the company level

Cash flow analysis for 10 to 20 years

This analytical process will result in efficiencies that benefit the municipality, the MHE and consumers

But the work does not stop here...

... you will move on to higher levels of efficiency and benefits.

**Helsinki Energy** has been requested and been able to pay more than € 80 million, about 20% of the turnover, to the municipality budget every year in terms of various fees. This has been possible, because the highly integrated CHP/DH system operates efficiently at low costs [www.helsinginenergia.fi](http://www.helsinginenergia.fi).

**Gothenburg** has replaced fossil fuel consumption with a variety of waste heat sources in the city in order to supply sustainable DH to the customers. In 1979 oil accounted for about 90% of the fuel mix, but oil use has practically vanished (about 1% in year 2003). This has had a substantial impact on air quality and energy efficiency in the region [www.goteborgenergi.se](http://www.goteborgenergi.se).

## References:

I would like to thank **Mr. Arto Nuorkivi**, from the Helsinki University of Technology for his authoritative guide on district heating prepared for the Energy Charter Secretariat's series on municipal best practices [www.encharter.org](http://www.encharter.org) and comments from **Mr. Magnus Rysted**, CEO of NEFCO at [www.nefco.org](http://www.nefco.org).

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