

# Global District Energy Climate Awards

Copenhagen- 3rd November 2009 r.



**Name of the system:**

The heating system of Poznań consists of two separate enterprises, which cooperate closely with each other. Both of them belong to one group of companies: Dalkia Polska.

**Manufacturer:** Dalkia Poznań Zespół Elektrociepłowni SA  
61-016 Poznań ul. Gdyńska 54  
Private Ownership

**Distributor:** Dalkia Poznań SA  
60-321 Poznań ul. Świerzawska 18  
Private Ownership

**Person submitting the portfolio:**

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*Clear skies above the EC Karolin is our quality mark*



*A piece of the overhead heating system providing citizens of Poznań with heat.*



*Within the city revitalization programme, Dalkia connects to the network buildings of historical value, earlier heated by non-ecological coal resources*



*Trigeneration - simultaneous production of heat, electricity and cooling - a method of highly effective use of the energy contained in fuel.*





## Introduction

The heating system in Poznan is managed by two enterprises: Dalkia Poznań (distributor) and Dalkia Poznan ZEC (producer).

### Two companies – one system



- production of heat and electricity in cogeneration
- 968,7 MW of heat power
- 275,5 MW of electrical power



- management of district heating network
- 441 km of heating network
- 3994 of heat centres
- 7089 heated buildings
- Dalkia covers over 50% of heat demand in Poznan



Both companies have a common development policy, common customer's approach and common external communication. Over 800 Dalkia employees is working day by day to assure a secure and continuous heat delivery for the Poznan agglomeration.

### The City Of Poznan

Poznań is one of the oldest and largest cities in Poland. It is the historical capital of the Wielkopolska Region, where the Polish State was born 1000 years ago. Today, Poznań is an important centre for trade, services, industry, culture, higher education and science. It is also among the leading Polish cities in terms of its economy.

Poznan is situated midway between Berlin and Warsaw, 160 km from the border with Germany. The city is inhabited by 561 00 people. Poznań is characterised by a highly developed technical infrastructure. There are 228 000 dwellings in the city, more 50% of them are using the heat from Dalkia.



Poznań constitutes a powerful academic and scientific centre. There are 25 higher schools attended by 141 000 students. In 2012 Poznan will be one of the Polish cities hosting the EURO Football Championship on the stadium, that is heated by Dalkia.

*Dalkia operates in the most prestigious hotels in Poznań, as well as shopping malls and cultural institutions.*

#### The most important data from system's history:

- 1967 - establishment of the Miejskie Przedsiębiorstwo Energetyki Ciepłej in Poznań. Redevelopment of the Garbary power plant into CHP Plant (EC 1).
- 1969 - Establishment of the first technical emergency unit for citizens
- 1972 - commencement of the Karolin heat and power plant (EC II) construction
- 1975 - connection of EC 1 and EC 2 into one business organization - Zespół Elektrociepłowni Poznań. Putting into use the first heat supply main supplied from the EC 2.
- 1976 - transformation of the MPEC into Wielkopolskie Przedsiębiorstwo Energetyki Ciepłej, which also incorporates the other systems in Wielkopolska.
- End of the 70s - beginning of the system's automation, a pioneer project for both heat and power plants conversion into mutual network in an open system, executed jointly by ZEP and WPEC.
- 1991 - a change in WPEC business organization, establishment of Przedsiębiorstwo Energetyki Ciepłej in Poznań
- 1993 - commercialization of Zespół Elektrociepłowni Poznań, establishment of Zespół Elektrociepłowni Poznańskich SA
- Early 90s - beginning of exchanging 600 hydroelevator heat distribution centers for compact ones (energy-saving) and removing 300 coal boiler houses (emissions' reduction)
- 1997 - commercialization of the PEC and the establishment of Poznańska Energetyka Ciepła SA
- 1998 - launch of the third unit (BK 100) together with modern flue gas desulphurisation system
- May 2002 - privatization, Dalkia Termika takes over 51% of PEC Company S.A. shares
- March 2004 - privatization, consortium of Dalkia Termika and PEC SA take over 85% of Zespół Elektrociepłowni Poznańskich SA shares.

## Technical properties of the heat supply.

The elementary heat supply for the Poznań municipal heat distribution system consists of EC 2 Karolin CHP plant, located at ul. Gdyńska 54. The heat is supplied by a network through three heat supply mains. At ul. Marii Panny 2, the heat plant EC 1 Garbary is located, which is connected with EC 2 Karolin via southern supply main. Currently, the heat plant serves as a peak and backup supply.



*The interior of the Karolin CHP Plant engine room*

EC 2 Karolin is a unit heat and power plant with three heating units heated with bituminous coal - BC50, BC100 and BK100. BK100 unit is able to work in condensation. Capacities of the elementary production units:

- BC 50 heating duo unit of 126 MW capacity, heated with hard coal
  - BC100 heating unit of 192 MW capacity, heated with hard coal
  - BK100 heating and condensation unit of 205 MW capacity, heated with hard coal
- The capacity of peak units:
- water boilers 2 x PTWM-180 of total 309 MW capacity, heated with heavy oil (mazout)
- Total capacity of the EC 2 amounts to 832 MW.

EC 1 Garbary has the function of peak and emergency supply launched when the temperature stays below 6°C. The following boilers are used for heat production:

- stoker-fired boilers 3xWR23 of total 51.0 MW capacity, heated with hard coal
- water boiler PTWM50 of 58,0 MW capacity, heated with light oil or gas

Total capacity of the EC I amounts to 109.0 MW. The supply has got the water treatment systems to fill the losses of heat carrier of continuous efficiency 140 m<sup>3</sup>.

### Network properties

The heating system provides heat to customers by means of hot water of heating factor temperatures 130/70 °C and pressure up to 1.6 MPa. It supplies the recipients in Poznań, Swarzędz and Koziegłowy.

The heating network has the radial-annular layout ensuring safety of heat supply in emergency situations.



Until 1995 the network has been constructed with the use of so-called pipe network technology. However, after the aforementioned year the networks are laid-out through preinsulated pipes technology. The total capacity of heat distribution system together with interior systems, amounts to approx. 84,000 m<sup>3</sup>, with the network being approx. 470 km long.

The maximum flow in the computation conditions amounts to 10,500 t/h. The flow of heating carrier to the farthest recipients amounts to approx. 8-10 hours. The work of the network is programmed and supervised 24 hours a day by the system's operator. Work control is conducted through telemetry system. The system enables remote regulation of the pressure available in the network and total or partial turning off network's sections in the emergency situations. The heat reception is held through exchangeable heat distribution centres, fully automated.

Dalkia in Poznań covers over 50% of the Poznań agglomeration heat demand. Heat is provided to 5567 buildings of total square footage 11,942,759.96

**System's heat sale:** 6,380 TJ in 2008.

**Average age of buildings:** EC Garbary - the oldest, approx. 80 years old, buildings modernised for several times and maintained in technical efficiency (confirmed by the state UDT - Office of Technical Inspection examination), EC Karolin - the oldest buildings - approx. 30 years old, the majority is several or a dozen or so years old (as well examined by UDT). The average age of the heat pipes - 21 years (the oldest from 1960), examinations as above.



## A clean, safe and affordable heat supply system

Energy production system in Poznań operates in cogeneration and partially in trigeneration. Simultaneous heat, electric energy and ice water production enables the use of above 80% of energy contained in fuel (the conventional coal power plants' production efficiency is 40%).

For over two years EC Karolin has been using the biomass, co-incinerated with coal, in the process of energy production. In 2008 EC Karolin co-incinerated approx. 45,000 tons of biomass, which influences lowering the CO<sub>2</sub> emissions. Dalkia's prospects include the increase of the biomass share in the fuel mix.

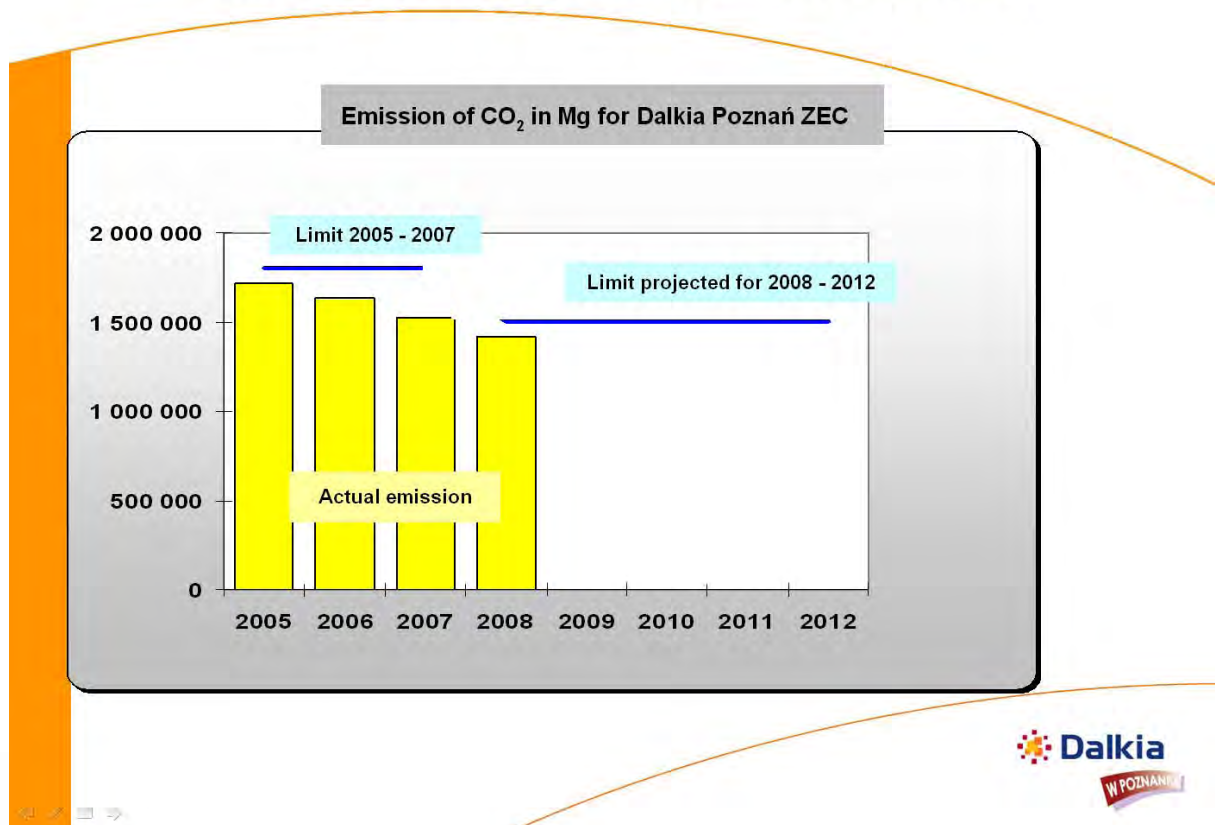
The CO<sub>2</sub> emission stays below assigned limits and norms of emission. The same applies SO<sub>2</sub> and NO<sub>x</sub> and dusts.

Within the last 10 years Dalkia Poznań has closed down all (over 300) of its local coal resources and modernized the existing gas and oil resources and thus enabled almost quadruple reduction of CO<sub>2</sub> emission, and almost complete SO<sub>2</sub>, soot and dust reduction.

Owing to the exchange of heat distribution centres from hydroelevator to compact ones (600 heat distribution centres) the use of electric power has decreased from over 14,000 to 9,500 MWh a year.

Full automation of the centres (weather automation) and the exchange of pipes from duct to preinsulated (currently over 21% of the pipelines, annual increase of

## Sustainable development - environment

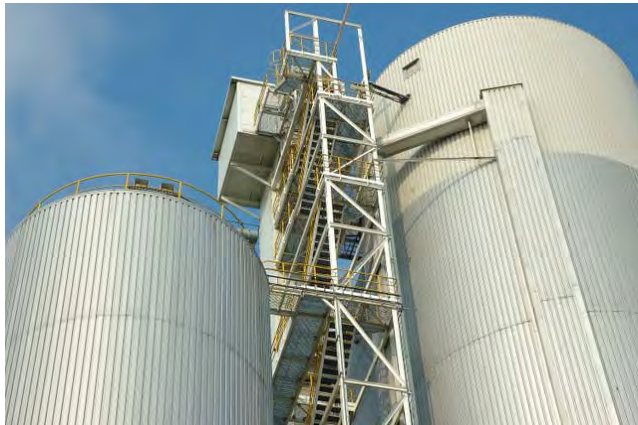


2-3%) accounts for a losses decrease in the flow and decrease in the number of breakdowns, which also contributes to more effective use of primary energy.

Apart from closing down of its own low-emission resources, Dalkia in Poznań has been conducting since several years a programme of old city districts revitalization. Within the scope of our activities, a heat distribution network is constructed (for the sole cost and risk of Dalkia) in the historical or socially neglected districts of the city, in which local coal furnaces, emitting noxious substances to the environment, are the predominant mean of heating. Our initiative enables the tenants of such buildings a transfer to more ecological way of heating - system heat, including access to hot water. Loan surcharges system for installation exchange (already finished) has been created for the underprivileged citizens, and Dalkia also offers to help in system installation and regulation. Until today, several dozen of low emission resources have been removed, for capacity over 10 MW, which has enabled a decrease of noxious emissions in Poznań, e.g. the CO<sub>2</sub> emissions have decreased for approx. 9000 tons.

Both Dalkia companies use an Integrated System of Management based on requirements of the: ISO 9001, ISO 14001, BS-OHSAS 18001 norms. Additionally, Dalkia Poznań operates pursuant to AQAP 110 norm (NATO certificate).

EC Karolin has electro filters of dust extraction efficiency over 99%, the flue gas desulphurisation system, as well as low-emission burners (reduction of nitrogen oxides). The emissions from power plants are monitored online by the appropriate environment protection services at the premises and in controlling institutions (Wojewódzki Inspektorat Ochrony Środowiska). All emission norms are observed, and the Company is fully transparent.



*ways of limiting noxious emissions to the environment.*

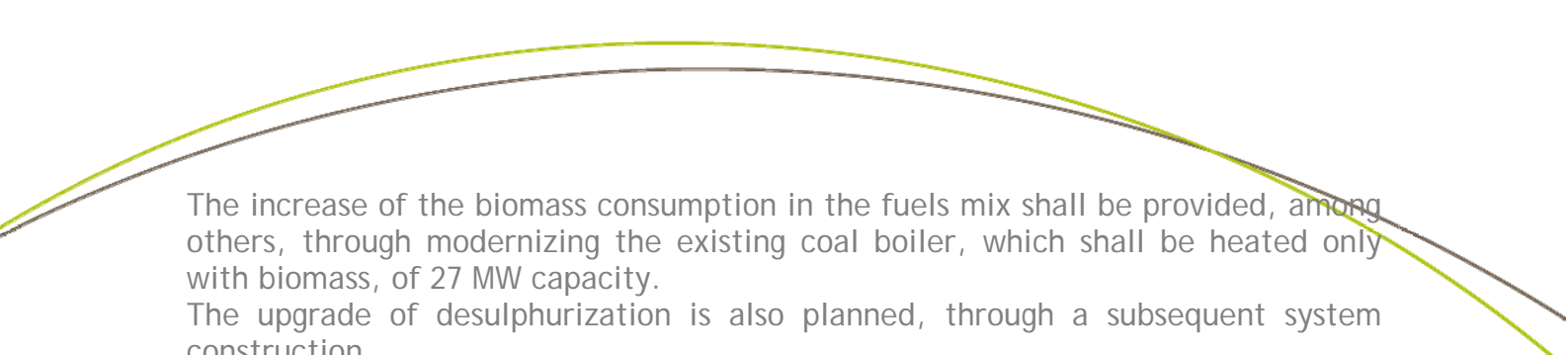
*Modern flue gas desulphurisation system is one of many*

In 2009 hydraulic slag removal and ash removal is no longer in operation. The ash as a by-product of the technological process comes out dry and is fully utilized, by Dalkia's subsidiary, for the purpose of road works and construction materials industry.

Dalkia is a member of the System Heat promotion programme. This programme promotes the heat from municipal networks as the most ecological one (save for Renewable Energies) and, if used in cogeneration, also the most energy-effective heat carrier in the Polish municipal systems. At the same time, Dalkia supports the thermo-modernization programme of our customer's buildings, by accepting and planning in advance the expectations of energy reduction ordered by the buildings' owners. For the year 2009/2010, Dalkia plans, jointly with the City Office, to launch an educational campaign encouraging reduction of energy (heat) consumption, including the pilot programme of thermo vision measurements. Not until this year, the regulations regarding energy certification of buildings became effective in Poland. Dalkia shall actively support both energy audits at customers and the optimization of the use and managing the energy media.







The increase of the biomass consumption in the fuels mix shall be provided, among others, through modernizing the existing coal boiler, which shall be heated only with biomass, of 27 MW capacity.

The upgrade of desulphurization is also planned, through a subsequent system construction.

Within the distribution management, Dalkia accomplishes a programme of telemetry incorporation of all possible network points. Currently, there are 1,200 of them, and the target number is over 4,000. Dalkia also uses modern IT tools: we use specialized GIS software for the purpose of heat network management, and MAXIMO and MONA programmes in order to control managed systems and to prevent breakdowns.



## Working for the benefit of the customers

Enterprises from the Dalkia Group in Poznań currently work jointly for the benefit of their customers, taking into consideration their individual needs. Dalkia Poznań



ZEC stays in constant contact with direct customers (several of them) who receive electric power (the biggest distribution companies in Poland - Tauron, ENEA, PGE Elektra and PSE Operator) as well as technological steam.

For customer relations, a dedicated team works in Dalkia Poznań ZEC. Also a partner marketing programme has been operating in Dalkia Poznań for several years, which enables

*Customer care: work in the Karolin Combined Heat and Power Plant control room lasts 24 hours a day, 365 days a year*

customer segmentation and taking direct "care" of them via appointed customer supervisors (from Dalkia Poznań and Dalkia Poznań ZEC). The supervisors meet customers several times a year and during the meetings they analyze the quality of performed services, contract parameters and present proposals of both improvement and new products. Special work meetings are organised for part of selected customer groups - e.g. for housing cooperatives or industrial customers. Each of Dalkia's strategic clients (approx. 150) receives annual reports from the Company. Information concerning price policy is handed over to the customers directly on individual meetings and mail, and additionally, the relevant information is published on web sites of both companies and always made available to the media, particularly local ones. Each year theme seminars are organised for customers (in recent years, among others: energy management in industry, multitechnical services, energy saving at final recipients). Dalkia in Poznań flexibly reacts to all requests concerning power changes from customers. In order to improve the comfort of the service provided, we intercept the heat distribution centres and the remaining heating and energy systems; we offer device regulation and heat consumption measurements. Owing to the telemetry system we improve heat consumption reading, without the necessity of customers being at their premises. We meet our clients not only because of content-related issues. We invite our key customers to artistic events, over which we held sponsorship (theatre plays, concerts, exhibitions) and to the events in the scope of our activities (e.g. Power Engineer's Day celebrations)

For a couple of years, the meeting within the framework of Dalkia Artystycznie (D'Arte) is a cultural event, dedicated specially to our customers. It is held in no longer operated engine room of EC Garbary (postindustrial interiors), in which interesting and acclaimed artists connected with French culture are presented.



## Impact on the community

Vocational organizations, in which Dalkia companies have their membership:

- ilzba Gospodarcza Ciepłownictwo Polskie - Chamber of Commerce Polish District Heating
- Association of Polish Electrical Engineers
- Polskie Towarzystwo Elektrociepłowni Zawodowych - Polish Association of Professional CHP's
- Business Center Club
- Polish Confederation of Private Employers „Lewiatan”

Some of the awards and distinctions:

- Medale Europejskie BCC dla usług [for services]
- Laur Ciepłownictwa IGCP
- Perła Polskiej Gospodarki
- Wielkopolska Nagroda Jakości
- Laur „Białego Tygrysa”
- Nagroda Fair Play

For years, both Dalkia Companies have been supporting and organizing activities for the benefit of local community, and for the improvement of life quality in Poznań. The projects connected with low-emission resources removal, the revitalization of old city districts and education campaigns aimed at the citizens of the city, showed remarkable effects seen in the improvement of the air quality in the city centre.

Due to the limited space provided, we enumerate only the most important examples from recent years:

We cooperate with the City Office, Powiat Starosty and Voivodeship Office.

The examples of activities are as follows:

- Open Days i.e. Ciepła Sobota z Dalkią - the possibility for citizens to



visit the heat and power plant and to get familiar with the arcane knowledge heat production and distribution in city. Sightseeing of the system is connected with a picnic. Also, we organize visits for school groups.

*During the Open Days, citizens of Poznań familiarize themselves with the energy production arcane*

Each year (for over 10 years) approx. 1,000 people visit our premises.

- Dalkia Foundation operates in Poznań, and its aim is to help unemployed in vocational development, which has already served several hundred people. The Foundation offers training, grant funding



for commercial business establishment and mediates in the employment of its dependants.

- „Zielona Energia” - together with the City Office and Philips Company we have handed over 100,000 energy-saving fluorescent lamps to teenagers from Poznań.
- Through the whole 2008 we have been cooperating with the City Office during the Year of Climate and Environment in Poznań, which culminated in Climate Conference and its side events
- Within the cooperation with the Veolia group, Dalkia being the part of which, prepared the balance of sustainable development for Poznań, which was presented during the COP 14 and showed the factual state and possibilities of CO<sub>2</sub> emission reduction by the citizens.
- Support of the Poznań promotional campaign, connected with launching the new elephant run - colorful sculptures of elephants wandered across Poland, becoming an attractive cultural event.
- Educational campaigns, e.g. Szkoła z Klimatem or Młodzieżowy Szczyt Ekologiczny - lecture and contest cycle for all educational levels in Poznań, devoted to the topics of responsible use of energy and natural resources.



*Winners of one of many ecological contests organized by Dalkia in Poznań*

- We support picnics and ecological contests organized by the City and Voivodeship authorities as well as by our customers (housing cooperatives).
- We support local cultural and sport initiatives (in 2009 among others: Teatr Scena na Piętrze, Poznańskie Koncerty Jazzowe in the Old Town, „The freedom beach” project, Grand Press Photo exhibition, cultural events organised by La Maison de Bretagne in Poznań)
- Dalkia is one of the main partners of the Commercial Forum of Poznań Agglomeration, known as „Davos of Wielkopolska”