THE FRENCH DISTRICT HEATING MARKET – OVERVIEW, OPPORTUNITIES AND CHALLENGES

HEAT NETWORKS
SUSTAINABILITY BY SWEDEN

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HEAT NETWORKS - SUSTAINABILITY BY SWEDEN

FOREWORD

Sustainable Heating and Cooling is a Swedish priority, nationally and internationally. The theme is included in the French and Swedish strategic partnership for innovation and green solutions signed by the governments of Sweden and France in November 2017.

Transforming the heating markets in Europe and globally to more renewables and better efficiency is key for achieving sustainability goals including climate targets and better city environments.

The Swedish heating market is already almost fossil free. In Sweden, district heating has a 90 per cent market share for heating multiple dwelling buildings, while we can find the world's largest share of heat pumps for heating detached houses. District cooling networks are also already established in all major cities in Sweden.

Since 2016 the Swedish Energy Agency has, in collaboration with Business Sweden, initiated the Heat Networks program for the UK market, aiming at introducing Swedish suppliers to the expanding UK district heating market. The program has comprised more than 40 Swedish suppliers of technology and services to the heating market.

In 2018 the Agency decided to expand the program in scope and scale and has reframed it as *Sustainable Heating and Cooling by Sweden,* in order to not limit the program to district energy networks, even though this will continue to be the first priority. The expansion in geographical scope quite logically includes turning to the French heating market, since there is large political support for transforming the heating systems into more renewables and also expanding district energy.

This report has been produced by Business Sweden France as a welcome overview of the French district heating market. The purpose is to illustrate the structure of the French market to Swedish suppliers, identify opportunities for Swedish businesses, as well as possible pathways for Swedish companies to enter the market.

Paul Westin
Senior Business Developer
Swedish Energy Agency

Paul Westin
Swedish Energy Agency

TABLE OF CONTENTS

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THE SWEDISH ENERGY AGENCY (2019)

1. INTRODUCTION

The French Government has bold ambitions to multiply the quantity of heat from renewable sources by five until year 2030, based on 2012 levels. With French climate goals being described as ambitious by the French Government, district heating is seen as a key tool in the national plans for energy transition.

France has a well-established district heating sector with 761 heat networks, and is looking to expand, develop and upgrade. As the scale up of the operations in France is currently taking place, the district heating market shows potential for Swedish district heating companies.

As Sweden is home to a wide range of companies possessing experience and know-how regarding effective implementation and running of heat networks, Swedish district heating companies face prospects of developing and strengthening their positions in France, by working towards and together with French DH stakeholders.

This report produced by Business Sweden France strives to serve as an introduction to the French district heating market, by outlining the key metrics, main stakeholders involved in the development of district heating networks, political policies driving the market forward, as well as geographical differences. These factors combined are then used in order to give recommendations for Swedish suppliers on how to address the French district heating market.

The report being based on interviews and analysis of existing available data, Business Sweden France would like to thank all interviewees for their valuable contributions.

5

The factor with which the French Government plans to multiply the quantity of heat delivered from renewable sources before 2030, based on 2012 levels.

200

The potential number of French local authorities with between 10 000 and 20 000 inhabitants to be part of an assessment project running during 2019-2020, regarding the possibility of investing in district heating.

300

The number of million EUR in place in the 2019 budget of the French public investment heat fund (Le Fonds Chaleur), intended for subsidizing of heat technology development during 2019.

2. THE FRENCH DH MARKET

The overall heat market

The national heat consumption in France is about seven times higher than in Sweden, but only 3.5 per cent of the heat demand is provided by heat networks. The domestic sector is the biggest consumer of heat, and gas is the main energy source in the national heat energy mix.

The annual heat consumption of France is estimated at 705 TWh, whereas about 19 per cent of the heat is from renewable sources. Gas has long been a dominant fuel in the heat energy mix, but is on the decrease due to France's current energy transition towards renewable fuels.

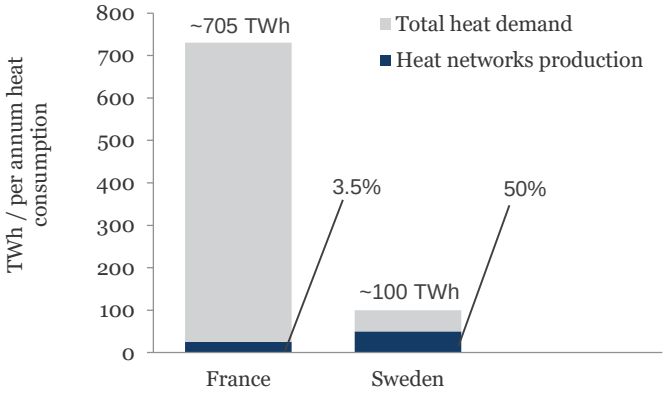
Looking at the total heat demand in France, the domestic sector stands for about 56 per cent of the demand, and it accounts for 75 per cent of the total consumption of heat from renewable sources. In comparison, the service sector stands for 18 per cent of the national heat demand, and the industry sector stands for 26 per cent of the national heat demand.

Something that the domestic and service sector have in common is that heat is a very dominant component in the energy consumption. About 75 per cent of the total energy consumed by the two sectors is going towards heating.

When it comes to district heating, French industries are the smallest consumers of heat provided by district heating networks, representing only 4 per cent of the total consumption. Strictly talking further about heat produced by district heating networks, the domestic sector stands for 56 per cent of the consumption, and the service sector for 35 per cent.

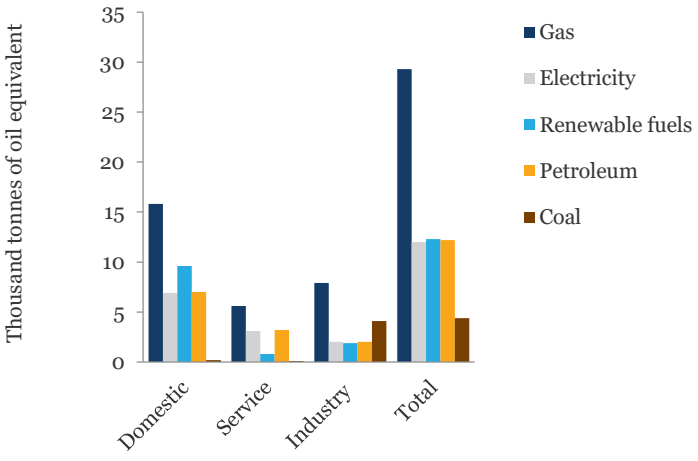
French annual district heating production is 25 TWh as of 2017, meaning 3.5 per cent of France's heat demand is provided by district heating networks. In the district heating energy mix, renewable fuels constitute 56 per cent (including waste heat), which can be compared to the European average of 28 per cent. District heating currently covers approximately 8.5 per cent of French households, in comparison to a 51 per cent household coverage in Sweden, and a 2 per cent coverage in the UK.

Estimated heat demand in France compared to Sweden



Source: Fedene 2018, Euroheat & Power

French heat consumption by sector and use



Source: European Commission 2014

Heat networks in France

French district heating networks together generate 25 TWh annually, meaning 3.5% of all heating in France is represented by district heating.

The number of buildings connected is steadily growing

Out of the 28.7 million households in France, approximately 2.4 million households are connected to district heating networks, meaning a national household coverage of about 8.5 per cent. In comparison, approximately 51 per cent of all households in Sweden are connected to district heating. The number of connected buildings in France has grown steadily during the last years. From 2013 to 2017, the average yearly connection rate amounted to an annual increase of 6.6 per cent, with 38 200 buildings (in total representing 2.4 million households) being connected in total in France by the end of 2017.

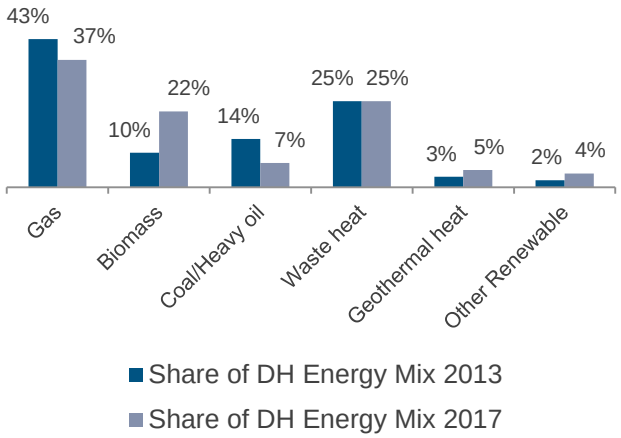
The district heating energy mix

The overall district heating energy mix and its evolution is represented by the diagram at the top right of the page. The diagram visualizes the current transition towards renewable fuels within French district heating. For example, biomass usage among DH networks increased from 10 to 22 percentage points during the 2013-2017 period, while coal and heavy oil usage dropped from 14 to 7 percentage points during the same period. In total, 56 per cent of fuels used by heat networks are renewable (waste heat included). One identified problem for the evolution of the energy mix is that gas prices remain low, hindering further development of fossil free energy sources.

Comparing output per given length between France and Sweden

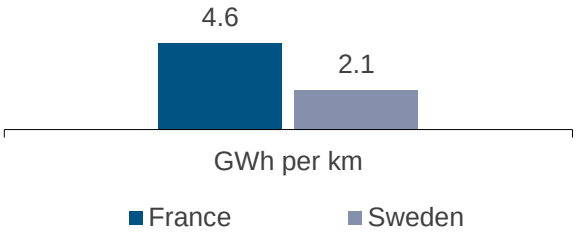
When comparing output per km of French and Swedish networks, there is a disparity that can mainly be described by two factors. Firstly, lower pressure in Swedish networks generate lower power per kilometre. Secondly, French networks are generally shorter than their Swedish counterparts clustering a larger number of buildings therefore increasing output.

French District Heating Energy Mix Evolution - 2017 versus 2013



Source: Fedene Annual Heat Networks Survey, 2017 and 2013 statistics edition

Output per km of networks – France and Sweden



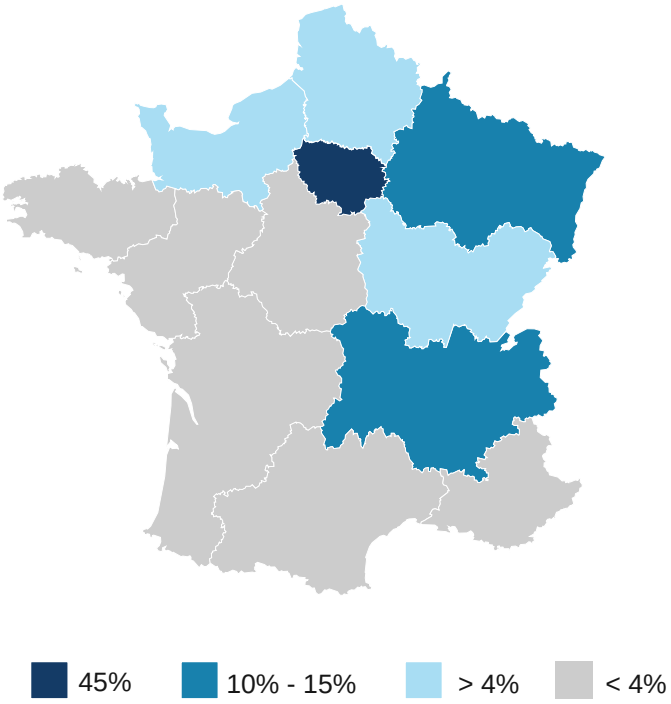
Source: Fedene, Cerema, Euroheat & Power, Energiföretagen

National overview

There were 761 district heating networks in France at the end of 2017, with a total combined network length of 5 397 km. The biggest deliveries of heat, and also the largest number of heat networks are to be found in the north and eastern parts of the country. The Île-de-France region alone represents 45 per cent of the national consumption of heat produced by district heating.

In the eastern parts of France where on one hand heat networks deliver heat in a larger scale, the share of renewable fuels in the district heating energy mix is on the other hand below the national average, and as low as 38 per cent in the northernmost region Hauts-de-France. Traditionally, eastern parts of France have harsher climate, which is a key reason for the historically early development of heat networks in the region in relation to the rest of the country, and as a result reliance on fossil energy to a greater extent.

Country overview
Distribution of national district heating production (part of national production per region)

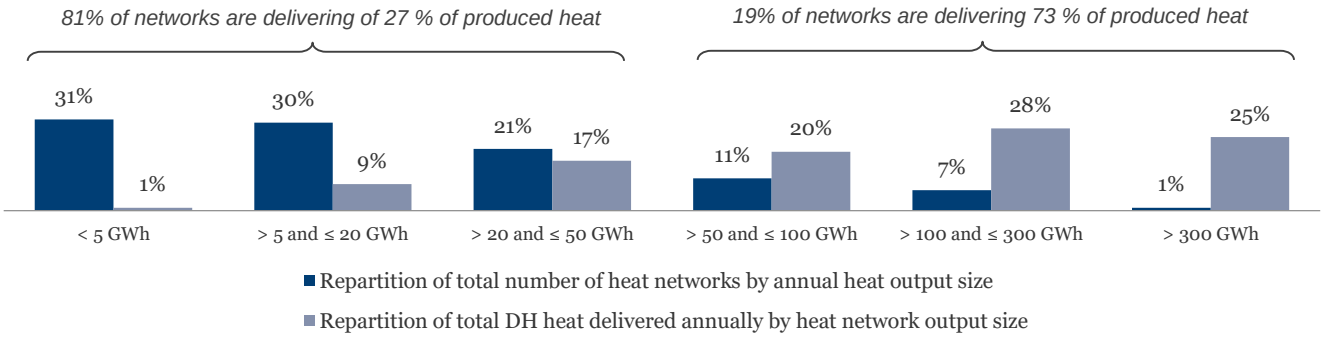


Source: Fedene / SNCU 2018

Development trends

In 2017, the national production capacity of heat networks increased by 0.5 Mtoe, compared to the previous year. The major national trend when it comes to heat networks development is upgrading and expanding already existent networks, so called brownfield networks, and 94 percent of the capacity increase in 2017 was due to upgrade and expansion of existing networks. Development of completely new networks represented 6 per cent of the district heating capacity increase of 2017.

Categorization of heat networks and heat delivered by DH network output size



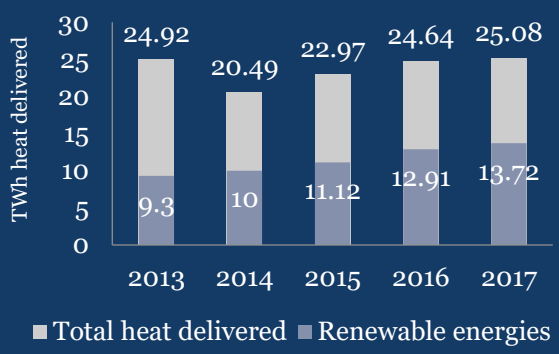
Source: Ministry of ecology and solidarity Transition 2014

National overview – Mainland France

The map below is indicating current regional statistics for French brownfield heat networks, and it shows a notable pattern. The share of renewable energies in the north and north-eastern regions is significantly lower than in the rest of the country, due to older networks relying on fossil fuels to a greater extent. The development of heat networks started historically early in the north and north-eastern regions of France.

Furthermore, as indicated by the diagram to the right, based on the most recent data at the time of this report, the volume of renewable heat delivered by heat networks in France increased on an annual basis between 2013-2017, while the total volume of heat delivered increased between 2014-2017 (after a decrease between 2013-2014).

Evolution of total heat delivered by French heat networks



Source: Fedene Annual Heat Networks Survey 2017

Source: Fedene/SNCU 2018

Main stakeholders in the French district heating industry

Main energy operators managing 73.5% of French heat networks

Energy operator	DH related turnover in France	Ownership structure	Geographical footprint	Number of heat networks
dalkia GROUPE EDF	Approx. 4 bnEUR	**French state-owned electricity provider EDF:** 100 %	National coverage	350
ENGIE	Approx. 3 bnEUR	**French state:** 23.64 % **Other:** 76.36%	Ile-de-France Rhône-Alpes (East) Loire-Atlantique (West)	160
idex Efficience Energétique	Approx. 1 bnEUR	**Antin Private Equity**	Ile-de-France Bordeaux Nice	50

Governmental support functions

ADEME

- **ADEME** is the French energy agency in charge of applying policies dictated by the French Government
- Responsible for allocating resources from the public investment fund Le Fonds Chaleur
- 17 regional offices manage funding of DH projects locally

Cerema

- **CEREMA** is an operational governmental institution assisting local authorities in their environmental transition strategies
- Services include feasibility studies assessing the potential for district heating networks

Trade associations

Fedene / SNCU

- **FEDENE** is regrouping stakeholders within the energy efficiency industry
- **SNCU** is **FEDENE**'s district heating sub-organization focusing on DH
- **SNCU's** main objective is to promote and lobby for the development of district heating on a national and European level

AMORCE

- **AMORCE** regroups local authorities sharing best practices regarding district heating development
- Represents local authorities in political dialogues on a governmental level

FNCCR

- **FNCCR** advices 800 public authorities in leasing important public services to public and private companies offering energy, water and waste treatment and digital services

Policies driving the market

The French Government is a strong market driver. France targets to reach 32 per cent renewable energies in the global energy mix by 2030. Furthermore, the country plans to multiply the quantity of heat from renewable energies and heat recovery by five by 2030, in comparison to 2012 levels. Heat networks are viewed as an important solution to reach the stated targets, and their development is supported by three main policies that have been set in place.

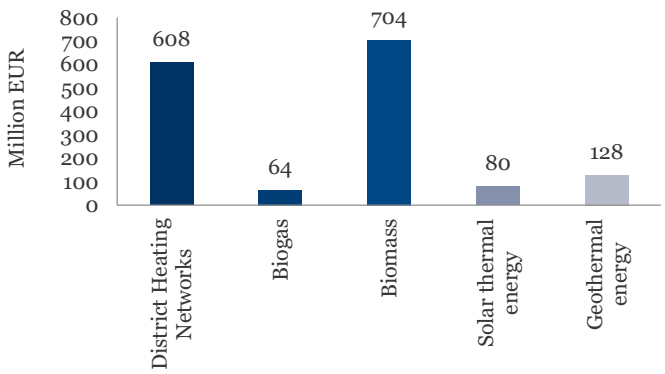
Le Fonds Chaleur - The public investment heat fund

Ambitious governmental incentives to steer and support the development of heat networks and other heating technology are mainly channelled through the public investment heat fund, Le Fonds Chaleur. The fund is governed by ADEME, the French Environment & Energy Management Agency, and it aims to support several different heating operations across the country, with a current annual budget of 300 million EUR. Total subsidies through the fund amounted to 1.6 billion EUR between 2009 and 2016.

The fund finances projects managed by public as well as private companies, and it subsidises between 20-30 per cent of a project's total costs. Subsidized district heating projects range from installations to feasibility studies, and during the 2009-2017 period, the fund was involved in the financing of 4300 projects, with biomass-related projects being the most heavily subsidized.

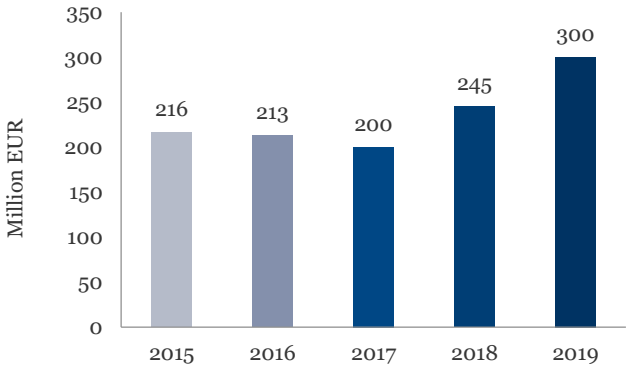
With oil and gas prices staying low, the French government is expected to continue to add funding to decrease the average price of heat generated from renewable fuels. France's national cross-sector investment plan for 2018-2022, with a total budget of 57 billion EUR, is partially targeting the public investment heat fund with further adding of funds, as a means to reach the goals of realizing an energy transition towards more renewable fuels in the global energy mix.

Le Fonds Chaleur (Heat fund), repartition of subsidies by project type, 2009-2017



Source: Ademe, Report on Le Fonds Chaleur 2009-2017

Annual budget of Le Fonds Chaleur



Source: Ademe, The French Senate report

Reduced VAT-rate for sustainably produced heat

A key policy supporting renewable district heating is the reduced VAT-rate. Heat produced by district heating networks with at least 50 per cent renewable fuels in the energy mix is subject to a reduced VAT-rate in France, from the normal 20 per cent, to the lower rate of 5.5 per cent.

The reduced VAT-rate makes renewable heat networks more competitive in relation to heat sources with an energy mix consisting of primarily non-renewable fuels, as the lowered rate makes a direct impact on the heat consumers' energy bills.

Certificats d'économie d'énergie – White certificates

Another key steering tool in the French market is the program of *White certificates* (French: Certificats d'économie d'énergie, CEE in short). White certificates are issued by the state and forces French energy suppliers (electricity, gas, heating oil, LPG, heat, refrigeration) to meet government-mandated targets for energy savings achieved through the suppliers' residential and tertiary customers.

Energy suppliers involved in the CEE program face penalty fees based on their scale of operations if proved failing to meet their targets assigned by the program. However, energy suppliers have the ability to buy and sell CEE obligations within the group of energy suppliers involved in the white certificate program.

For the 2018-2020 period, the goal of the CEE program is to achieve national energy savings of 1600 TWh. For scale, the total energy consumption of France amounted to 2906 TWh in 2017.

"Le Fonds Chaleur is the most important tool to promote district heating from a governmental point of view."

French District Heating Trade Association Representative

Key policies for district heating – top-down overview

1. Le Fonds Chaleur – The public investment heat fund

- Governed by ADEME, the French Environment & Energy Management Agency
- Aims to support several different heating operations across the country
- 608 million EUR in allocated subsidies targeting district heating between 2009-2017
- 300 million EUR projected to be added annually going forward as of 2019

2. Reduced VAT-rate for heat networks with renewable energy mix

- Heat produced by District Heating Networks with at least 50 per cent renewable fuels in the energy mix is subject to a reduced VAT-rate
- For this heat, the VAT-rate is 5.5 per cent instead of the standard 20 per cent
- Makes renewable heat networks more competitive in relation to heat sources with an energy mix consisting of primarily non-renewable fuels

3. Certificat d'Economies d'Energie (CEE) - White certificates

- Issued by the state and imposes French energy suppliers to meet government-mandated targets for energy savings
- Energy suppliers failing to meet their assigned targets face penalty fees
- Obliged energy suppliers imposed under the CEE program can trade CEE:s
- For the 2018-2020 period, the goal of the CEE program is to achieve national energy savings of 1600 TWh

Energy resource development

Sustainability: above the EU average, but far below Sweden

In Sweden, renewable and reused heat sources together account for about 93 per cent of the total district heating energy mix (including waste heat). France's share of renewable fuels in the DH energy mix is 56 per cent with heat waste included, a share roughly twice as big as that of the EU average of 26 per cent. Thus, France's DH energy mix positions the nation well above the EU-average, but far below Sweden.

Biomass is a top priority in French district heating

During the 2009-2017 period, biomass projects were the top priority of the public investment fund, Le Fonds Chaleur. Biomass-related projects were the top recipient of subsidies from the fund, with 44 per cent of all fund assets going towards the development of the renewable fuel.

The transition towards a wider use of biomass can be seen in the evolution of the French district heating energy mix over the last five years, where biomass has more than doubled in commonness. Biomass generates 25 per cent of the total heat demand in France as of 2017.

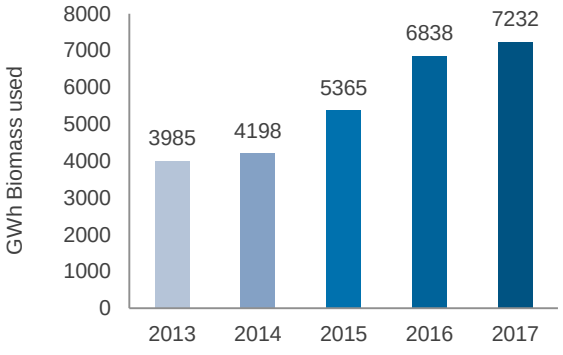
The reason behind the shift towards biomass can be explained primarily by the government goals regarding energy transition towards a greater usage of renewable fuels, and the abundance of biomass sources in most parts of France. The abundance of biomass is explained by the fact that France has among the largest forest acreages of Europe with 17 million hectares, combined with the second largest agricultural industry in the world. In addition, the relatively low price of biomass in comparison with other available fossil energy sources, coupled with its independence from price volatility of energy markets, makes it an attractive fuel.

Although perceived as a priority to meet energy transition objectives, biomass boilers are mostly situated in rural areas and cannot contribute to the improvement of large cities' energy mixes to the same extent, due to the sheer size of such installations. French heat networks relying heavily on biomass as fuel distinguish themselves as numerous, but generally small in size with smaller-scale energy outputs. Furthermore, while biomass usage has increased steadily during the last years in France, the fuel is not perceived as abundant enough to replace current fossil fuels being used on its own.

Swedish experience within biomass can be applied to a French context

The Swedish district heating industry is an extensive user of biomass solutions. In total, 44 per cent of Swedish district heating fuels originate from biomass, meaning Sweden has come a long way in the usage of the fuel. Sweden has the largest forest cover in all of Europe with approximately 30 million hectares of forest. Being such a forest-covered country with extensive access to biomass sources, Sweden's usage of biomass as a fuel is logical, and the Swedish experience of biomass could potentially be of big interest to the French market, where the fuel is a top priority.

Biomass used in French heat networks, 2013-2017



Source: Fedene Annual Heat Networks Survey, 2013-2017 editions

“Biomass is an interesting fuel that we are looking into using more in the city’s heat networks. However, biomass is not abundant enough for it to drive the transition towards renewable fuels on its own.”

Network Planning Engineer, Local District Heating Company, France

Natural gas prices remain an obstacle for further district heating development in France

France has historically been a proponent of using natural gas in order to generate heat, in comparison with the Swedish energy mix where gas has historically represented a relatively small share. Due to the continuous importance of gas in the French energy mix and the fact that major energy operators are important suppliers of natural gas, the fossil energy source has become a major obstacle for the development of district heating industry.

Most of French district heating networks relying on a large share of renewable energy find it difficult to further tilt the energy mix towards renewable fuels, as these sources are perceived as more expensive to invest in.

District heating energy is promoted as not as price volatile as natural gas

District heating energy from renewable sources remains stable around 75 EUR/MWh. French stakeholders state that district heating prices levels should remain between 70 and 75 EUR/MWh in order to efficiently compete against fossil fuel based energy.

Approximation of average price per MWh in France and Sweden (incl. VAT)

Type	France	Sweden
District heating	75-77 EUR	78.5 EUR
Gas	71 EUR	118 EUR

Source: IEA - International Energy Agency, AMORCE, Swedenergy

The French deferred carbon tax ramp-up increases uncertainty

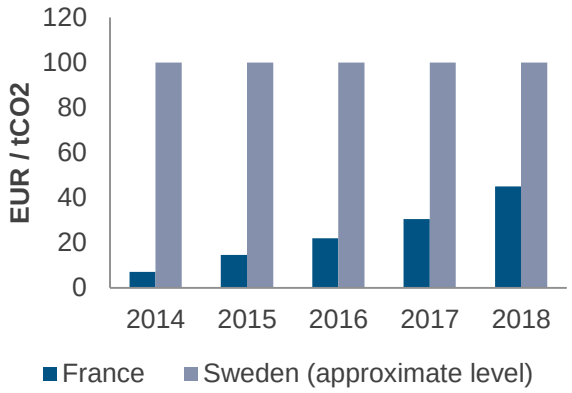
The French Government decided to defer the increase of the much debated carbon tax, which would have increased the tax for companies and households consuming fossil energy sources, after massive protests from the *Gilets Jaunes* (*Yellow Vests)* movement during the end of 2018 and beginning of 2019.

The French carbon tax was predicted to increase from 44.6 EUR/tCO2 in 2018 to 55 EUR/tCO2 in 2019 and steadily increase to reach 86.2 EUR by 2022. In comparison, the actual carbon tax in Sweden is 114 EUR/tCO2 as of 2019.

French stakeholders state that an increase of the French carbon tax would favour district heating networks, which are mostly generating heat from renewable energy sources. With an increased carbon tax, the demand would shift towards renewable energy at an accelerated pace because of higher costs for fossil energy.

As there is no indication if or when an increase of the French carbon tax would be implemented, district heating in France currently needs to rely on other policies favouring its' development.

Carbon tax development in France and Sweden



Source: Fores, Business Sweden research

“Natural gas prices remain very low which makes district heating not as attractive as it could be.”

Energy Director, French Metropolis

3. HEAT NETWORKS OWNERSHIP STRUCTURES

There are three types of ownership structures of French district heating networks which depend on the level of technical complexity, amount of investments and need for dedicated human resources, in French named *Régie*, *Affermage*, and *Concession*.

Public management (Régie)

A public authority invests in the building and management of a heat grid. This type of contract mainly involves small cities with a relatively low number inhabitants. In comparison to other types of ownership structures, the required value of investments and complexity levels are often perceived as low for publicly managed networks.

Private contract through leasing (Affermage)

A public authority invests in physical district heating facilities that are then leased out to a private stakeholder managing the heat networks and the underlying risks. Contract durations can often span over 20 years. Contract duration varies depending on the need for investments in extending or densifying the networks.

Private contract through concession (Concession)

Without any initial investments a public authority commissions the investment and management of a heating grid to a private operator. The contract durations varies depending on the types of investments needed throughout the contract duration.

Another type of concession involves a public authority leasing a network to an energy operator controlled by the same public authority, which has the know-how human resources and financing to manage the local heat network.

Public management

Public management is predominantly used in small cities requiring low levels of complexity

Public management contracts represent between 3 -5 per cent of the total heat generated by French heat networks. The reason behind the low levels of generated heat is due to the fact that the majority of public management contracts are operating rural networks, out of which approximately 80 per cent generate an effect of between 500 to 3000 kW.

Due to the low complexity and investment costs, local authorities tend to have the financial capacity and required competence to manage smaller networks.

As the complexity, financial commitments and the need for human resources increases as cities become larger, local authorities tend to contract private energy operators to lease out the management of the heat networks. The number of publicly managed networks therefore remain stable over time and do represent a modest portion of the generated heat in French through heat networks.

A few number of cities, such as Metz in the North-Eastern part of France with approximately 118 000 inhabitants, have due to historical reasons invested in a publicly owned utility company managing the cities need in terms of heat, electricity and telecommunications. The city of Metz controls 85 per cent of the capital, without any private stakes interfering in the management of the company.

Small communities can to some extent co-invest in centrally managed heating networks. This type of investment scheme is however uncommon.

Private contract – leasing to private or to public energy operators

Leasing is the preferred contract type for large French cities where networks can be leased to several operators

Larger French cities possess dedicated energy departments involved in the planning of heat networks conducting feasibility studies, evaluating the suitable energy mix and pricing models. The already constructed networks are then managed through a leasing model where both private and public energy companies answer call for tenders initiated by the cities. There can be several district heating networks managed by different energy operators in the same city, thus increasing competition among bidding energy operators. The leasing energy operators usually operate the networks during a period of 15 to 30 years, depending on the needed investments to fully operate the network.

French metropolises such as Lyon, Bordeaux and Lille have dedicated energy departments collaborating with energy operators during the leasing period.

Leasing to public energy operators is less common

In order to increase the control of the development of district heating networks, cities can initiate and at the same time answer call for tenders through publicly owned energy companies. This is fore example the case of Paris, through the publicly owned company CPCU and Grenoble, through CCIAG.

The companies are not totally public as there is either a majority stake from a private energy operator, Engie in the case of CPCU, or a minority stake, Dalkia in the case of CCIAG.

With local authorities controlling the local energy operator, investment strategies in renewable energy are perceived as more agile as the decision process from decision to implementation is shorter coupled with lower requirements on investment returns.

There are different ownership types for delivering heat

Heat networks managed through a concession type of contract stand for approximately 92 per cent of all heat produced by district heating in France.

Heat networks managed through public management contracts stand for 7 per cent of the national district heating production capacity.

The remaining 1 per cent of production capacity derives from heat networks managed by any other types of contracts.

Source: Business Sweden approximation based on Fedene Annual Heat Networks Survey, 2017 data edition

4. INVESTMENT PROCEDURE

Steps in the construction of new heat networks

The investment phase of district heating consists of several steps. In order for a local authority to initiate an investment, local political representatives must be agreeing on the benefits of such an investment in order to initiate several feasibility studies prior to construction of a heat network.

There are then several call for tender periods before the city's heat is managed through district heating

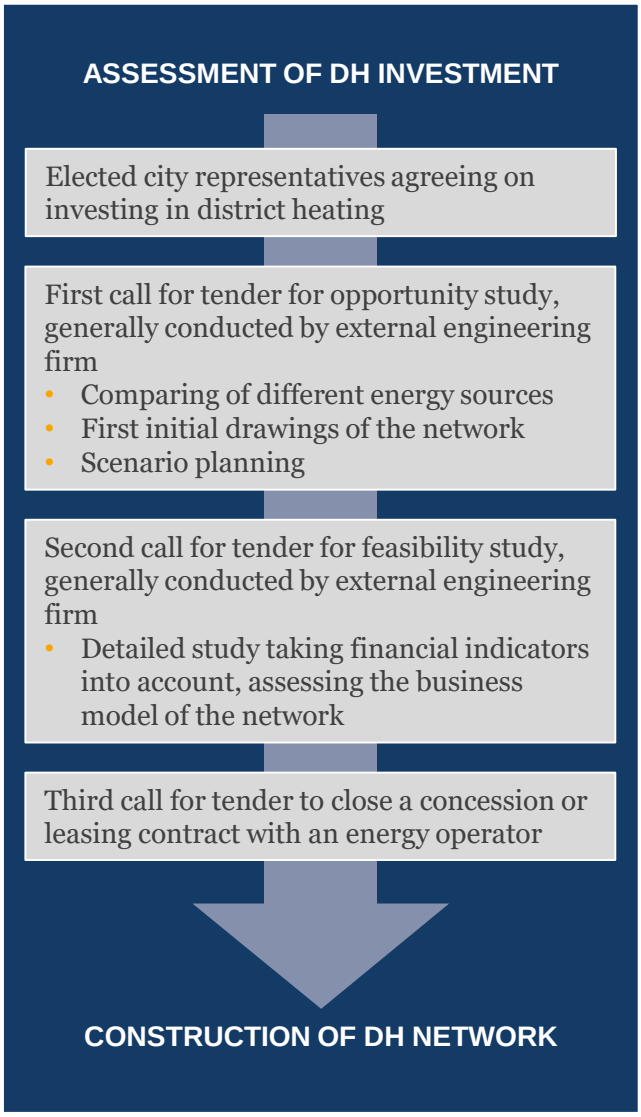
There are five main stakeholders involved in the investment process:

- Local authority representatives
- French state support and development organisation ADEME
- French state feasibility study organisation CEREMA
- Externally contracted engineering firms
- Public or private energy operators

Governmental organizations proactively reaching out to local authorities to initiate feasibility studies driving development

In order to accelerate the energy transition towards renewable energy, French organisations supporting local authorities in this transition will initiate a coaching project during throughout 2019 and 2020, proactively contacting local authorities with a population between 10 000 and 20 000 inhabitants to assess the possibility of investing in heat networks.

As there are currently 200-300 cities with a population over 10 000 inhabitants that are yet to be connected to heat networks, French organisations see great potential to increase the connectivity rate in rural areas where knowledge about heat networks is relatively low.



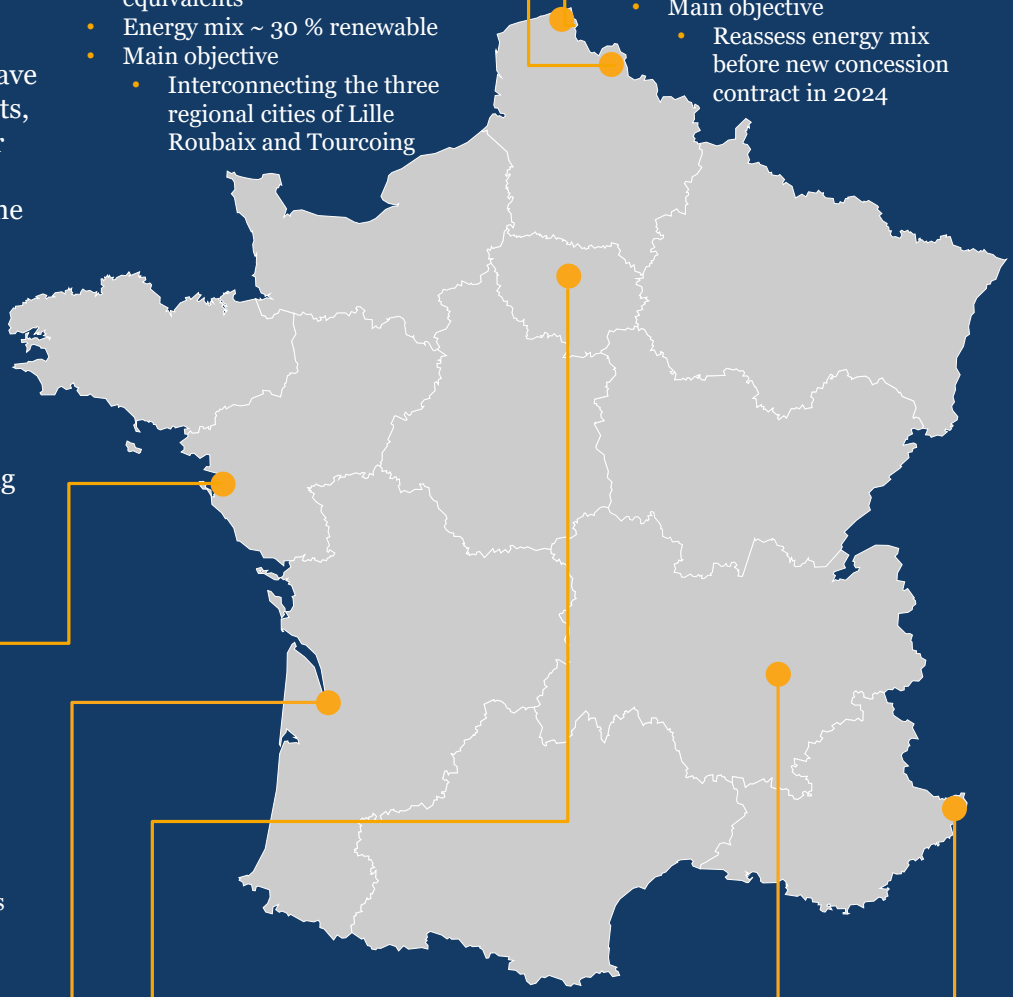
Identified cities driving the DH development

Business Sweden has mapped several cities that are driving the DH development in France, by conducting interviews with French stakeholders.

Most of the mapped cities are considered regional capitals and have therefore opted for leasing contracts, collaborating with Engie, Dalkia or Idex who can operate different networks independently in the same city.

All cities have development plans either extending, densifying or further improving the energy mix.

The list of cities and operators managing the cities' district heating networks is not considered exhaustive.



Lille
- Network operator - Dalkia
- Contract and duration - concession renewed in 2024
- Connectivity rate: 50 000 household equivalents
- Energy mix ~ 30 % renewable
- Main objective
  - Interconnecting the three regional cities of Lille Roubaix and Tourcoing

Dunkerque
- Network operator - Dalkia
- Connectivity rate: appr. 10 000 household equivalents
- Energy mix ~ 64 % renewable, mainly generated from industry waste heat installations
- Main objective
  - Reassess energy mix before new concession contract in 2024

Nantes
- Network operators – Engie , Dalkia and Idex
- Contract : concession
- Effect: 7 networks
- Connectivity rate: 30 00 household equivalents through 7 networks
- Main objectives
  - Stabilizing district energy prices to compete against gas
  - Improve connectivity to social housing buildings
  - Double renewable energy sources by 2020

Bordeaux
- Network operators: Engie and Idex
- Effect: 5 networks
- Connectivity rate: 40 000 – 50 000 household equivalents
- Energy mix: Focus on biomass and geothermal energy
- Main objective: improve energy mix

Grenoble
- Network operators: CCIAG
- Contract and duration: concession running for a period of 15 years
- Connectivity rate: 100 000 household equivalents
- Energy mix ~ 67 % renewable
- Main objective: further densification of heat networks

Paris and its' suburbs
- Network operators: Engie and Idex
- Effect: 5.2 TWh, representing 50 % of Engie's national turnover being France's largest heat network
- Connectivity rate: 500 000 household equivalents
- Objective of extending network

Nice – Meridia
- Network operators: Idex
- Effect: being under construction, the objective is to generate eat and cold mostly from geothermal sources
- Connectivity rate: 500 000 m² of buildings

Identified challenges for the French DH industry

Identified challenges currently faced by the French DH market for further development

Macroeconomic challenges

Gas prices remaining at low levels favouring the usage of fossil energy

Although the large majority of stakeholders have understood the benefits and the predictability of energy costs stemming from DH networks, lower gas prices have slowed down the transition away from fossil fuel based energy towards renewable energy sources.

Energy operators currently facing the challenge of becoming a competitive heat provider, stress the fact that heat provided by heat networks can be marketed as predictable in order to mitigate the current gas prices levels.

Political challenges

Difficulty of applying policies in a regional context

There is a potential dissonance between governmental goals and regional goals. France has approximately 35 000 local municipalities (most in Europe by far, 290 in Sweden), which brings difficulty to finding unity in the realization of national plans for DH, where regional initiatives are key.

Remaining uncertainties regarding the carbon tax

Due to the recent social protests in France, the increase of the carbon tax has been put on hold. This has increased the uncertainty for future heat networks development as the carbon tax would have according been an instrumental tool to increase the competitiveness of district heating.

The French carbon tax is expected to remain stable and will not be relied upon to drive the development of DH in the near future.

Low level of local know-how to effectively promote DH locally

Local authorities in scarcely populated French municipalities lack human resources and local know-how that is needed to analyze and specify the needs for initial investments in heat networks.

These authorities risk to lag behind the development already initiated in densely populated areas.

Operational challenges

Deliver both heat and cold on demand

In order optimize the production and distribution of heat, French district heating networks must improve their reliability regarding heat-on-demand. However, most of networks are not adapted to that type of technology as of today.

Energy operators are at the same time facing the challenge of a growing need for cooling networks implying delivery of heat and cold from the same network.

High return temperatures and poorly isolated buildings

Older networks representing a large part of the French district heating industry usually generate higher temperatures resulting in high pressure in the delivery pipes, leading to loss of large amounts of energy.

At the same time, buildings connected to current district heating networks tend to be poorly isolated.

Different ownership structures between primary and secondary grids

Primary and secondary grids tend to be outsourced to different types of companies, increasing the complexity of delivering heat due to the value chain being broken up.

“Swedish companies need to have a long-term mindset in France. The market is rather opaque, which means that opportunities arising are hard to grasp, which means that a company needs to constantly monitor the market.”

Company Representative, Swedish Energy Consultancy Company

“The large energy companies in France need products for different types of applications in their networks and do therefore not exploit economies of scale. It becomes challenging for us to adapt our products to each specific need.”

Manager, Swedish District Heating Solution Company

5.PREREQUISITES FOR ENTRY FOR SWEDISH COMPANIES

The French district heating sector appears attractive seen to its potential to deliver a larger share of the national heat supply. The French government puts effort in setting ambitious targets and following up on these targets through public financing and expertise assistance, coupled with ambitious goals from energy operators extending their networks and generating greater amounts of energy from renewable energy sources.

In order to successfully tackle the French district energy market, Swedish companies must assess whether they have the resources and capabilities to address the French district heating market.

Strong energy operators need solid value propositions

The French district heating market is of duopolistic nature with the two main energy operators being Dalkia and Engie, together managing 67 per cent of all heat networks in the country. The character of the market implicates that Swedish companies' potential energy operator clients have the ability to exploit their strong bargaining power.

When striving to access the right sales channels, a facilitator for Swedish companies is to collaborate with convinced local representatives in order to effectively promote their products or services.

French end clients will often require a proof of concept before agreeing in buying a Swedish solution, which means that potential suppliers must come up with effective ways to leverage existing relationship with other customers to convince French clients.

Long sales processes often require dedicated resources at different levels of client company

As a supplier to a French energy operator, Swedish companies need to be present on every level of the client company: strategy team, engineering team, technician level in order to promote their solution both directly and indirectly. Being an efficient strategy, it is often demanding in human resources, requiring a long-term mindset to monitor the market and identify arising business opportunities. Close and continuous contact with customers will then be key in order to further grow on the French market.

National and regional presence is important

Even though most decisions are taken on a central level, stakeholders interviewed by Business Sweden describe it as substantially beneficial for Swedish suppliers to be able to meet representatives of potential clients regionally, in order to build brand recognition and get a deeper network of contacts.

“After investing in dedicated human resources we increased our sales towards energy operator key accounts.”

Sales Engineer, Swedish District Heating Solution Company

“Once you supply a product to a market, you will need regional presence in order to be close to your customers.”

General Manager, Swedish District Heating Solution Company

6. CONCLUSIONS

The French district heating sector appears attractive from a potential point of view. The French government puts considerable effort in setting ambitious targets and following up on these targets through public financing and expertise assistance.

At the same time, private energy operators set goals in extending their networks and generating larger amounts of heat stemming from a growing amount of renewable energy sources. Dalkia, Engie and Idex are the main energy operators representing three quarters of heat networks and are investing heavily on the French territory.

District heating in France is on the other hand growing from relatively small figures compared to its' Swedish counterpart. Currently producing 3.5 per cent of the consumed heat in France, the French district heating market cannot rely on policies such as an increased taxation of CO_2 emissions, to curb the consumption of fossil energy-based heat and favour renewable district heating energy.

Western parts of France have lagged behind in the district heating networks development compared to north-eastern regions where district heating had been a heating source historically, still today relying more on fossil energy to fuel its' networks.

French networks are predominantly managed by private operators ensuring investments in improving or extending where connectivity rates and complexity levels are high. Contract duration usually spans between 10 and 30 years and depends on the need of investments during the contract duration period. A handful of French cities control the management of their networks independently from private energy operators, but the concession contract type however remains by far the most common type of ownership.

French district heating networks' energy mostly comes from renewable energy sources, which energy mix is above European average. Biomass is perceived as a key energy source driving the development of further improving the overall energy mix. Other renewable energy sources will on the other hand be needed as biomass cannot cover entirely for the future decrease in consumption of fossil energy sources.

Swedish companies in the district heating sector face interesting prospects in France as there are both private and public initiatives to further extend the networks. As energy operators have strong influence over district heating investments, potential Swedish suppliers must have consistent and long-term strategies, clear value proposition and the capacity to monitor the market as opportunities arise.

7. RECOMMENDATIONS

Based on the conclusions in this report, the recommended actions for Swedish companies who wish to enter the French market are the following.

Evaluate the potential

1. Read this and other reports and ask questions to ensure you understand the market
2. Further evaluate the business potential for your products and services, e.g. evaluate customer segments and assess the competition
3. Evaluate which services and/or products to supply to the French market
4. Seriously consider if you have the time and resources to enter the French market

Develop an engagement strategy

1. Prioritise what customer segments to focus on
2. Evaluate possible sales channels to reach prioritized customers
3. Consider possible establishment options or partnerships at an early stage
4. If relevant, consider how to manage installation and maintenance from Sweden
5. Evaluate how to position your offering towards competing solutions
6. Consider possible marketing channels and how they can be utilised to influence key opinion leaders and potential customers
7. Set realistic clear goals for the market
8. Develop a realistic budget and set aside resources to be able to engage with the market

Engage in the market

1. Map customers, key opinion leaders and other potential stakeholders
2. Start building a network, increase your knowledge about the market and engage with your potential customers by attending industry specific forums and events, e.g. seminars, conferences and trade fairs
3. Adopt offering to the market and focus on solving the problems of the potential customers in France
4. Engage with influencers and in marketing channels
5. Start to engage with potential customers and key opinion leaders
6. In parallel to all above, further evaluate establishment options or partnerships

Abbreviations used in the report

Abbreviation	Explanation
DH	District Heating
CO2	Carbon Dioxide
toe	Tonne of oil equivalent

Waste heat perceived as renewable in France

Waste heat is perceived as a renewable heat energy source in French district heating, and as a consequence also in this report.

HEAT NETWORKS
SUSTAINABILITY BY SWEDEN

Business Sweden France District Heating Group

Marie Eck
Senior Project Manager
marie.eck@business-sweden.se

Frej Ericson
Consultant
frej.ericson@business-sweden.se

Gilbert Gullberg
Associate
gilbert.gullberg@business-sweden.se

Business Sweden France Office
france@business-sweden.se
+33 (0)1 53 40 89 00


Sweden
Sverige
TEAM SWEDEN
BUSINESS SWEDEN
THE SWEDISH TRADE & INVEST COUNCIL
REGERINGSKANSLIET
Government Offices of Sweden
Swedish Energy Agency
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