

## EXECUTIVE SUMMARY

District heating can make a substantial contribution to a sustainable energy future in Central Europe and the former Soviet Union. It can save energy and boost energy security, but only if stronger policy measures to encourage wise management and investment are put in place there. District heating covers 60% of heating and hot water needs in transition economies. In Russia, it accounts for over 30% of total energy consumption. Yet some district heating systems face financial and technical problems, largely because of an inappropriate policy framework. District heating in Western Europe and the rest of the world can provide lessons to achieve greater efficiency and profitability in transition economies.

District heating is a system of centralised heat production and distribution typically for urban areas. The systems usually consist of heat plants (which often produce heat and electricity simultaneously) and a network of distribution and return pipes. The heat systems meet residential and commercial needs for space heating and hot water, and often provide heat to industry.

A few facts put district heating in perspective and underline why the International Energy Agency has focused on this issue:

- Because as much as 70% of families in transition economies rely on district heating, efficient management and organisation of heat supply are important to the energy security and social welfare of these countries.
- District heating accounts for 6% of GDP in Russia at current prices.
- With a stronger policy framework, district heating systems in transition economies could save in generation alone the equivalent of 80 billion cubic metres (bcm) of natural gas a year. This is roughly the annual gas consumption in Germany. These savings would also reduce greenhouse gas emissions by 350 million tons of carbon dioxide per year. Improved efficiency in distribution systems and in buildings would yield even greater savings.
- Russia consumes 150 bcm of gas each year for district heating, only 30 bcm less than it exports annually.
- District heating debts threaten to bankrupt many cities in countries where district heating policy has been neglected or where customers don't pay their bills. In Romania, these debts equal about 0.25% of GDP and reducing them has become a condition of future lending from the International Monetary Fund.

- About half of the largest district heating systems in the world are in transition economies. The rest are in Western Europe, North America and Asia. All IEA countries have district heating or cooling systems. District heating is growing quickly in Asia. District cooling is common in North America and growing in Europe.

This publication provides policy makers a guide to key district heating issues, first by demonstrating why district heating is worth pursuing, then why new policies are essential in most transition economies and finally by offering a menu of policy options that countries can adapt to their own needs.

In preparing this book, the IEA held discussions with about 350 policy makers and other stakeholders. Some of these discussions took place during two IEA-sponsored events: a roundtable on district heating policy in Paris in December 2002 and a larger conference on the topic in Prague in February 2004. IEA staff have also visited many transition economies to discuss district heating with national and local experts. And the authors have conducted an extensive literature search covering both transition economies and OECD members. The book has also benefited greatly from the comments of some 30 external reviewers.

The book focuses on former centrally planned countries transitioning to a market economy. Specifically, it looks at countries in the former Soviet Union and Central and South East Europe. Although it focuses on transition economies, the discussion of policy issues can find applications in many other OECD countries. Only a few OECD countries have an explicit district heating policy today. The potential environmental, energy security and social benefits of district heating warrant closer policy attention. Likewise, China has a significant district heating sector that shares many of the same characteristics as systems in transition economies. Thus the book may provide helpful insights to Chinese policy makers on designing optimal district heating policies.

## The Long-term Perspective

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Policy plays an important role in the long-term sustainability of district heating systems. Well-designed policies can help improve the quality and efficiency of district heating services, simultaneously improving the long-term sustainability of the industry. Many countries have only scattered policies on district heating that can actually undermine the development of the sector. Examples in transition economies include policies that do not allow district heating companies to recover their costs or that put district heating at a disadvantage because of subsidised residential gas or electricity prices.

Long-term sustainability is the key; too often the focus in district heating reform has been on isolated investment or technology fixes without considering the broader need for market reform and policies to support the sector's sustainability. This publication does not prove that district heating is inherently the best option in all cases nor that it should be cut back because it is currently managed in an inefficient way. Rather, it focuses on finding economically sound approaches to capturing the benefits that district heating and cogeneration have to offer. Long-term sustainability requires that district heating companies, policy makers and regulators place greater priority on customer needs and improved quality. In other words, more focus needs to be on the customers, not solely on production.

## Benefits of District Heating

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The first part of this book looks at why district heating is important and what challenges the sector is facing in transition economies. Chapter 1 provides an introduction to the major benefits and even critical importance of district heating, looking specifically at environmental protection, energy security and economic development in transition countries. Understanding these benefits can help motivate policy reform.

District heating can be very environmentally friendly when well managed. Existing district heating and cogeneration facilities, including industrial cogeneration, reduce the global carbon dioxide emissions from fuel combustion by 3-4% annually compared to a world without them. For comparison, the Kyoto Protocol sets a target for industrialised countries to cut their annual emissions by an average of 5%. Building new district heating systems based on cogeneration and improving the efficiency of the existing ones can significantly reduce carbon dioxide emissions.

District heating can have lower emissions than competing heat sources for several reasons. It provides a heat load that makes cogeneration possible, and cogeneration greatly raises the overall efficiency of power and heat production. In fact, gas-fired cogeneration produces about one-third the greenhouse gas emissions of a conventional coal-fired power plant based on total useful energy output from each; coal-fired cogeneration production is about half as polluting as conventional coal on this same basis. District heating can use energy from many sources, including industrial waste heat, heat from incinerators, geothermal energy and biomass. The Baltic States rely notably on biomass for their district heating. District heating plants are also usually more efficient than standard decentralised heating systems because

of economies of scale; this is particularly true in transition economies given the relatively low efficiency of the local boilers in use. On the negative side, district heating systems in the former Soviet Union tend to have high distribution losses, but the same is true to some extent for the gas or electricity systems that supply local heat sources.

District heating can also improve energy security. Its higher potential efficiency means that less energy is needed. It tends to use local sources or sources that would be wasted otherwise, like cogeneration, industrial waste heat and biomass.<sup>1</sup> Both these features of district heating lead to lower levels of energy imports. Because district heating plants can often tolerate multiple fuels, for example natural gas, fuel oil and renewable fuels, they also provide greater flexibility. District heating is a major source of energy in most transition economies, so it needs to be considered as part of overall energy security. For example, district heating breakdowns during cold Siberian winters caused numerous deaths in the early part of this decade; this spurred the Russian government to take a more proactive approach to district heating policy. Finally, district heating can affect international energy security because of its close link with natural gas. In Russia and Ukraine, where natural gas is the main fuel for district heating, the governments subsidise natural gas prices because of the social difficulty of raising district heating prices. If district heating were more efficient in these countries, such subsidies would not be necessary. Reforming the natural gas systems in these countries would improve international gas security by allowing multiple operators and encouraging needed investment in infrastructure, but this would first require raising domestic gas prices, and hence reforming district heating.

Reforming district heating can also promote economic development both because it is already such a large part of GDP in some countries and because more efficient district heating based on more rational pricing would promote competitiveness and economic efficiency. District heating reforms will also improve service quality.

Increasing energy efficiency in buildings with district heating would also improve social welfare because it would decrease household heat consumption and thus reduce the burden of utility payments on families without sacrificing comfort. In Russia, many families pay a third of their income for utilities. Improving energy efficiency in the district heating systems themselves will also reduce costs, which may help to reduce tariff pressure in some countries.

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1. District heating plants can also run on coal, another typically local energy source. Coal causes higher pollution levels than gas or industrial waste heat. Overall, countries in transition have decreased their use of coal for heating since 1990.



## The Challenges for Transition Economies

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District heating systems in transition economies often face financial, technical or managerial problems largely created by an inadequate policy framework. Chapter 2 describes these challenges: lack of customer focus, low efficiency, excess capacity, corruption and an uneven playing field. These challenges are all the more significant because they have implications for investment in the sector.

Lack of customer focus is probably the single largest weakness in district heating systems. Dealing with this requires a cultural shift from a production model to a customer-focused model of management. Such a shift will ensure that customers receive a quality service, which will likely increase their willingness to choose and pay for district heating services. In addition, it will force district heating companies to improve efficiency and better match supply and demand while limiting costs.

District heating can be very appealing for consumers. It frees residential users from the expense, hassle and reliability risks of maintaining individual boilers. In Finland and Sweden, where customers can choose between several heat sources, they usually choose district heating because it is convenient and competitively priced. These advantages develop from effective management (as well as a successful policy and regulatory framework). Yet district heating utilities in transition economies tend to focus more on the production and technical operation of their systems, and less on customer needs. Poor governance in the district heating sector is also a symptom of this lack of customer focus.

Most district heating systems in former planned economies are less efficient than those in the West. This inefficiency starts in the boiler house: transition economies use a much larger share of heat-only boilers for their heat supply than Western countries. Distribution systems can lose up to 30% of the heat they carry, though this is closer to 12% in Central Europe. Finally, buildings tend to be inefficient and often lack the thermostatic controls so important to comfort. Systems in the former Soviet Union and South East Europe tend to be much less efficient than those in Central Europe. This inefficiency raises costs, which puts pressure on households, particularly low-income families.

District heating systems in transition economies are, by and large, over dimensioned. In other words, their supply infrastructure is larger than necessary to meet current demand. This problem can be exacerbated when they lose customers. The balance of supply and demand is quite important: when systems have excess capacity, their costs are greater. Losses are higher

during operation at partial capacity, and maintaining a large system costs more than maintaining a small one. Such systems also have high fixed costs, which makes it increasingly difficult to lower costs when demand decreases. Service quality can also suffer, since systems that are too big are not flexible in adapting to changes in demand: apartments can end up too hot or too cold.

Most new EU members and accession countries have experienced a decline in market share for district heating. Other transition economies have seen total heat demand drop as their economies faltered, even if market share remained steady. Typically, building or apartment-level natural gas boilers are the main competitors. Natural gas prices were subsidised more heavily and longer than district heating prices in several of the countries with the sharpest decline in residential district heating use. In many cases, this has led to distorted investments in local systems that residents regretted once natural gas prices began to rise. However, poor management and service in district heating have also played an important role.

Demand is starting to grow again in many countries in transition. Ukraine saw a 9% growth in district heating demand in 2003, and in Lithuania, heat sales grew by 1% between 2000 and 2002, so the trends are changing, at least in some countries that have been more proactive about reform in recent years. Future demand trends will depend very much on the strength and clarity of district heating policy.

Clear and co-ordinated policy can ensure that district heating is operating on a level playing field with other heat sources and energy sectors. For example, liberalisation or subsidies in other sectors can have important impacts on district heating. Co-ordinated national policy helps ensure that measures are well balanced. Stronger policy can also help in improving governance in the district heating sector.

## **Policy Options for Meeting the Challenges: Two Paradigms**

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The second part of this book focuses on issues that are first-order priorities in ensuring the sustainability of the sector. Chapter 3 offers a choice between two paths to better balance supply and demand for heat and thus address many of the key challenges of district heating: better regulation or competition.

While policy makers should clearly select which approach to use to balance supply and demand: heat source competition, or tariff regulation and energy planning, this does not mean that either approach is completely devoid of



regulation or competition. A competitive regime will include environmental and safety regulation, for example, and a regulated regime may use wholesale competition to lower costs.

Getting the balance of supply and demand right is particularly important because so many other policies and challenges hinge on this decision. The right balance will go a long way in solving the problems of poor customer focus, inefficient supply and inadequate investment. The private sector will have much more incentive to invest when the sector is structured so that it can be profitable. Encouraging additional investments in cogeneration and energy efficiency will also be easier. In other words, getting this decision right can make policy making in other areas easier and more successful.

Markets can do an excellent job of balancing supply and demand when competition is fair and there are no major impediments to free trade in the heat market. Competition by nature forces efficiency improvements and provides incentives for companies to improve service quality. When this book refers to competition balancing supply and demand, it means competition between heat sources such as district heating or local gas boilers. Yet when markets are not balanced, for example, because of subsidies or lack of effective product choice, allowing the market to balance supply and demand alone can create major distortions in prices and investments. Thus, regulation can be a good policy choice in many situations, as long as the decision is made deliberately and with adequate consideration of the choices and alternatives.

If a country decides to use regulation to balance supply and demand, coherent energy plans are essential. Energy plans provide regulators with independent information to help ensure that service quality is high, costs are kept to a minimum and investments are justified, balancing the interests of heat supply companies with those of the public. If a country decides to introduce competition, it should monitor the market to make sure competition is fair and the market is balanced.

Table ES.1 summarises recommendations on integrating regulation and competition into policy. The first part of this table describes prerequisites and conditions that are necessary for both approaches.

In general, competition is best able to balance supply and demand in countries that are more advanced in economic reform and have lower poverty levels. Several countries in Central Europe are probably ready to allow the competitive market to set prices provided that the market is monitored. Regulating the balance of supply and demand through tariffs and energy. The

planning is more suitable in countries that still have energy subsidies and high levels of non-payment. In areas with extensive poverty, introducing heat source competition immediately may prove unfair to consumers because large parts of the population would not be able to afford to exercise their market choice.

**Table ES.1**

## *Policy Sequencing*

### **Essential Initial Steps**

1. Establish independent regulator.
2. Set up social support programmes and eliminate direct heat production subsidies.
3. Insist on good payment discipline through legislation and enforcement.
4. Require meters at interface with all buildings and large consumers.
5. Develop policies to promote demand-side energy efficiency.
6. Establish conditions that allow for full cost recovery.
7. Remove barriers to unregulated wholesale competition.
8. Involve private sector through privatisation or public-private partnerships.

### **Steps for Better Regulation**

1. Prepare realistic demand assessments and least-cost plans for high service quality.
2. Establish least-cost supply requirements and use competitive licensing to get least-cost new supply options.
3. Move toward more market-based tariff regulation (benchmarking, price caps with efficiency indexes or substitution tariffs).
4. In larger cities, require more extensive wholesale competition for long and medium-term heat contracts by unbundling production from transmission/distribution and establishing non-discriminatory transit tariffs.

### **Steps for Introducing Competition**

1. Remove barriers like subsidies for competing heat sources.
2. Establish more market-based tariffs.
3. Assess market conditions.
4. Establish a body that can review and act on complaints about abuse of market power.
5. Ensure that consumers can disconnect and require district heating companies to process such requests quickly.
6. Eliminate tariff regulation.
7. Monitor market annually and establish a clear process for reviewing and acting on this information, when necessary.



The chapter also considers several issues that governments need to address as prerequisites for either better regulation or competition: installing heat meters, enhancing payment collection and improving social protection systems. These measures will improve energy efficiency and give households more control over their bills, thus increasing the attractiveness of district heating.

## Regulation

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Chapter 4 examines policies on tariff regulation. It starts by highlighting one key condition of effective regulation: the independence of regulators. It then considers different approaches to tariff design taking policy priorities into account.

Regulation itself is not the reason why district heating in transition economies tends to be so much less efficient than elsewhere in the world. Poorly designed regulation, though, makes a significant contribution. This is true not just for district heating. Cost-plus tariffs, which are common in transition economies, allow district heating companies to profit more when costs rise. At the same time, current tariffs do not always allow district heating companies to fully recover the costs of their services, which damages the sector's economic sustainability. In countries with municipal ownership or subsidies for district heating, this creates a drain on municipal budgets. In some cases, tariffs also inadvertently favour individual natural gas heating over district heating.

By choosing to continue regulating prices, policy makers have an obligation to ensure that their regulation is as strong as possible. Ideally, well-designed regulatory approaches and heat tariffs should:

- Cover the full current costs of the heat supply company.
- Include replacement costs and return on investment.
- Allow sound operation and management of the district heating system.
- Be competitive with prices for other heat sources.
- Give the district heating company incentives to reduce costs.
- Give heat suppliers and customers incentives to save energy.
- Be transparent and easily understandable: customers should clearly see from the tariff what they are responsible for and how they can influence the heat bill.
- Protect consumers from unjustifiably high prices.

Better regulation can entail a market-oriented version of energy planning. Market-oriented energy plans take the private sector's role into account and try to ensure that district heating would be competitive (with high quality and low cost) if competition were launched. In other words, continued regulation should not be an excuse for continued poor service. An energy planning process allows policy makers and other stakeholders to decide proactively on how to provide this heat at least cost, even if in some cases this means installing local boilers in remote areas.

Policy makers should be open to several approaches to tariff regulation. Some types of tariff regulation are better at promoting efficiency than others. For example, price capping requires reasonable efficiency improvements over time; this regulatory approach has been used very successfully to improve system efficiencies in many Western countries. Some transition economies such as the Czech Republic and Lithuania now use it too. Benchmarking is another technique that regulators can use. It involves setting tariffs based on costs and prices at a set of peer companies. If the benchmarks are well chosen, they can help boost company efficiency without the need to estimate potential efficiency gains. Finally, substitution tariffs allow regulators to set tariffs at the cost of competing fuel sources, which means that regulated companies cannot charge excessive prices, but still bear the main financial risk of investment decisions. In practice, most countries in transition use cost-plus tariffs that reward district heating companies for low efficiency and high costs by letting their profits rise with costs.

Regulators can also use wholesale competition to keep district heating costs down and ensure least-cost supply (as described in Chapter 5). In its simplest form, this means arranging competitive bids for new supply, which then would entail some degree of wholesale competition between suppliers in a given system. Regulated wholesale competition only occurs in systems with tariff regulation. The most significant example of regulated competition is the greater Copenhagen area, where cogenerators and waste incinerators can sell their heat to two geographically distinct wholesale district heating companies. The sales are based on long or medium-term contracts. Several systems in large cities have unbundled generation from transmission and distribution, which makes it easier to compare supply prices. Wholesale competition is also quite common in unregulated systems, where there are no specific requirements for least-cost supply. In such situations, heat source competition stimulates the district heating company to find the most competitive supply options, including various forms of waste heat. Wholesale competition in the district heating sector will likely expand slowly, but it can bring greater efficiency, particularly because it provides a way to use industrial waste heat and boost heat sales from cogeneration.

## Competition

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Competition in heating is the norm in IEA countries. It is an essential element of market economies in general because it creates efficiency and better products, both of which could benefit the district heating sector in transition economies. The issue is how to ensure fair competition, since in most cities with district heating, there is only one district heating company. In addition, competition cannot work well when there are across-the-board subsidies for district heating or a competing heat source. Yet just because district heating cannot be liberalised in the same way as electricity, for example, does not mean that competition is impossible.

Competition between heat sources can effectively balance supply and demand.<sup>2</sup> Competition here means that consumers have a choice between different types of heat for their homes and offices. It exists in most countries in transition and it is most prevalent in the new EU member states. In these countries, it has come about not through a new regulatory framework but because of price and other market factors: gas tariffs remained subsidised longer than district heating tariffs, but poor district heating service also played a role in the growth of competing heating fuels. Finland, Sweden, the United Kingdom and several other OECD countries do not regulate district heating tariffs because they feel that competition from other heat sources creates a balanced market. In transition economies, district heating prices are still regulated (as are gas and electricity prices for residential users), but district heating companies can and do lose market share when their prices are too high or quality too low.

In general, countries that do not regulate district heating tariffs have lower prices. For example, Finland uses competition between heat sources to balance supply and demand; its district heating prices average about €30 per MWh. Neighbouring Denmark regulates heat prices based on cost and has made tremendous energy efficiency gains, but prices average just over €51 per MWh (both the Finnish and Danish prices are before value-added tax, to ease comparison). This represents a price difference of over 40%, which is quite striking. More comprehensive but unpublished studies also confirm this finding that heat source competition lowers prices, although obviously there are many factors that affect the final price of heat.

Countries have taken two approaches to heat source competition: competition with regulated prices and competition with unregulated prices. Prices in

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2. Wholesale competition by itself cannot effectively balance supply and demand because it does not give final consumers a choice. Thus, when this book refers to competition balancing supply and demand, it means competition between heat sources.

countries that do not have tariff regulation are generally lower than in those that do, possibly because tariff regulation reduces flexibility and creates an administrative burden, both of which add to costs.

Governments can ensure that the market is fair by monitoring it and setting up a process to review complaints about abuse of market dominance. Likewise, it is important to examine the market situation before launching heat source competition. These steps can help avoid major problems like those experienced in Romania when large numbers of the most affluent customers switched to subsidised natural gas.

Heat source competition does not work well when there are subsidies for any energy source, when non-payments are widespread, when a large part of the population is too poor to afford the costs of switching to local boilers, or when there are other major barriers to market equilibrium. Thus, regulation can be a better option than competition in Russia or most other countries in the former Soviet Union for now, though these countries should move towards competition by gradually eliminating barriers. On the other hand, many countries in Central Europe, particularly those that currently use more progressive regulation like price caps, should be ready to free district heating prices and allow the market to balance supply and demand. In fact, in some cases, continued price regulation may act like a weight on the district heating industry because companies are already forced to compete but do not have the flexibility to change their prices according to market conditions. Protecting customers is a noble goal, but in the end, if competition creates a stronger incentive to improve services and lower prices than regulation, it may protect customers best.

Chapter 5 also provides a description of wholesale competition, how it is applied today and the areas in which it could potentially grow.

## **Investment, Financing and the International Community**

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Chapter 6 highlights the difficulties the sector has faced in attracting sufficient financing for new technology. Underinvestment hurts competitiveness because it leads systems to deteriorate. Better access to financing, therefore, makes district heating more sustainable. This chapter describes different financing mechanisms that can help boost investment. It emphasises the role of the private sector and commercial financing, and discusses policy approaches to facilitate this process. It also describes how governments,



assistance programmes and international financial institutions can ensure that assistance is properly structured to improve policy.

Public and international financing should create favourable conditions for commercial financing and private investments. International and national financing or guarantee schemes can mobilise commercial co-financing by helping to allocate the investment risk between different investors. Generally, if commercial financing is available, grants, subsidies and other forms of direct financial support should be limited as they interfere with commercial investment decisions by distorting market signals. They may, however, be justified as a temporary tool for governments to promote an investment that is in the public interest, for example environmentally friendly technologies.

Commercial financing and private investment are playing an increasingly important role, notably in Central Europe and the Baltics. Other transition countries have some way to go to attract private investors to district heating. Well-designed policies are likely to make district heating more attractive to commercial financiers. Such policies include tariff policy aimed at cost recovery, a stable and predictable regulatory framework for district heating companies, legal mechanisms to enforce payment and policies to involve the private sector in district heating ownership and management.

The role of the international community is not limited to providing financial support. International co-operation can help former Socialist countries build viable district heating policies and integrate them effectively in overall national policy agendas. However, international assistance cannot replace effective national policy making. Rather it supports good policy making by providing national governments with information on the advantages and disadvantages of policies and implementation strategies.

## Ownership and Management

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The finances and competitiveness of district heating companies are closely linked to ownership and operating structures. Many district heating systems are owned by municipalities or the state, yet private sector participation is growing across the region. There are many ways to involve the private sector: from short-term service contracts to complete privatisation of district heating assets. Private-sector involvement can bring in new management skills and create new avenues for financing necessary upgrades. This is particularly true when involving large, international companies that have access to financing at a lower cost than might be available locally.

In general, there is more private-sector involvement in Central Europe and the Baltics than in the rest of the former Soviet Union or South East Europe. Both Russia and Ukraine, though, have seen a recent increase in leasing in the district heating sector, dominated by one or two domestic companies.

Private-sector involvement can help boost service quality and cost-effectiveness of district heating. Private ownership can also separate local policy decisions on district heating from the business of running district heating companies profitably. However, separating business decisions from political considerations can and should happen in public utilities too. When this is the case, there is no particular reason why a publicly owned utility could not act as a market-oriented, commercial company. Ultimately, the most important thing for a company's effectiveness is not its ownership, but its business culture and the conditions in which it operates. Therefore, an adequate policy, legal and regulatory framework is of utmost importance.

Any changes in ownership or managerial structure should take into account the long-term perspective, given that district heating utilities need large, long-term investments. If restructuring a district heating utility involves a private company, the latter should be invited through an open tender with clearly stated objectives, criteria and responsibilities. The choice of the private investor should be based on solid criteria and careful evaluation.

## **Cogeneration and Energy Efficiency**

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Technology is important to the future of district heating. District heating is appealing because of the environmental and economic benefits of efficient heat generation and cogeneration. Chapter 8 focuses on tapping these benefits through policies to promote cogeneration and energy efficiency.

Cogeneration is an essential reason why policy makers are attracted to district heating. District heating provides the demand for the heat produced in cogeneration plants. In many Western countries, one of the challenges of expanding cogeneration is finding a market for the heat. In transition economies, this heat load already exists because of district heating, yet less than half of the district heating comes from cogeneration. Cogeneration's share in district heating in Western Europe is higher than in most transition economies. This creates a significant opportunity for cogeneration in transition economies.

Cost allocation is very important for promoting cogeneration. Until recently, all the economic benefit of cogeneration in Russia and other former Soviet



countries was allocated to electricity, and the heat from cogeneration would actually be more expensive than heat from heat-only boilers. Even today, the split tends to favour electricity, making district heating companies less than enthusiastic about purchasing more cogenerated heat. There are several methods to allocate costs both fairly and simply, and the best choice typically depends on whether there is competition in electricity markets or not.

District heating also holds the promise of higher energy efficiency, which can bring significant environmental and economic benefits to a country. Most district heating systems in OECD countries are very efficient. Energy efficiency is still a challenge for district heating in former Socialist countries, even though it is more efficient than it was ten or fifteen years ago.

Chapter 8 describes the various policy tools that promote cogeneration and energy efficiency. They range from carrots like assistance with financing, best practice programs and tax incentives, to mandatory requirements or standards.

## **District Heating in the National Policy Agenda**

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District heating is a national issue in almost all countries in transition because of its economic impact and social importance. The 70% of Russian or Latvian residents who use district heating cannot find a new way to heat their homes overnight. Yet compared to other portions of the energy sector, there have been fewer steps toward reforming district heating. This may be in part because the problems seem too socially explosive to touch and as district heating is rarely a priority in the West, transition economies are not often encouraged to reform this sector in high-level dialogues.

Chapter 9 looks at why and how district heating needs to be integrated into the national policy agenda and then describes the progress of several countries in this regard. The chapter begins by looking at how district heating relates to national energy policy. Heat accounts for a large part of the energy balance in most transition economies. Dealing with heat in isolation from other parts of the energy sector can lead to poorly focused and contradictory policies. Developing unified regulatory methods and eliminating subsidies for more balanced competition are two examples of including district heating in a co-ordinated national energy policy. It is also important to consider district heating when liberalising electricity and gas markets. For example, if district heating competes with gas or electricity and its prices remain regulated after liberalisation in other sectors, the varying degrees of flexibility in setting

prices could create a barrier to balanced competition in the heat market. This is not to say that liberalisation must wait for all energy sources to move forward at the exact same time, but co-ordination and some synchronisation are necessary. Countries need to be aware of the impact that liberalisation in other sectors has on district heating and include the latter in the overall strategy. This task is easier when district heating is an integral part of national energy policy, the same policy that defines the schedule and approach to energy liberalisation.

There is also a symbiotic relationship between district heating and several other areas of national policy making that needs to be acknowledged and embraced to ensure the highest-quality policy. Environmental, housing, social and economic policies are a few such examples. In housing policy, for instance, the interaction of policies on home ownership and district heating can have a profound influence on energy efficiency. The structure of the housing market affects how much influence consumers have with the monopoly district heating suppliers. (In some countries, like Sweden, landlords have significant market power, in others, housing or condominium associations can act as an effective lever on heat markets). In addition, development policies can shape housing density and the cost-effectiveness of district heating. In most countries in transition, as in Russia, social welfare policy is closely linked with district heating policy, so the two issues must be addressed in a co-ordinated way. The size of the subsidies also makes solving these social issues almost impossible at the local level as some towns tend to be more affected by unemployment than others and taxes in most countries are levied primarily at the national level.

Given how important district heating is to so many aspects of national policy, it is surprising that until recently, Hungary was the only country in transition with a law on heat. Heat is mentioned in energy or electricity laws in most countries. Yet these references tend to be brief and often they treat heat like electricity, without recognising some of the fundamental differences between the two (like the highly local nature of district heating). Good policy requires broad discussion and clear representation of ideas. Enacting a heat law is one way to create a broad discussion and reach consensus and clarity. Formally issuing a policy on heat after extensive discussion is another potential way. However, just as important as reaching consensus on a formal policy is what the policy contains.

The lack of a clear policy toward district heating in most transition economies in the first ten to fifteen years of democracy has led to many of the problems of the sector. This is changing as countries recognise the importance of



district heating and good policy making in this area. In the last few years, several countries have worked on heat laws or have issued new secondary legislation on how heat is regulated and managed. Today, Estonia, Hungary and Lithuania have heat laws and at least four more transition economies, including Russia and Ukraine, have such laws under preparation.

Countries that want to promote district heating need to have a clear policy. They need not only to integrate district heating into their energy acts and policies, but also to be aware that district heating has a profound impact on economic, environmental, social, housing and privatisation policy.

Policy does make a difference. Clear, coherent policy can have a very positive impact on the development of district heating. Poor policy and lack of co-ordination can damage or destroy the viability of district heating in fairly short order.

## Conclusions

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The findings of this book lead to eight key conclusions, summarising the recommendations to policy makers.

First, countries should ensure that they get their policy for balancing supply and demand right, whether they use competition or regulation. They should decide clearly on the mechanism to use: regulation or the market. Heat policy or law should address the idea of investment based on least-cost planning, whether that planning occurs in the government or in companies through competitive pressure.

Second, they should encourage demand-driven business practices. Heat policy or law should also promote greater energy efficiency and customer focus, and outline how it will pursue these goals. If a country decides to regulate tariffs, it should recognise that the most important decision point is not the periodic tariff-setting, but rather investment approval. Tariffs should be structured to reward efficiency, not higher costs. And the potential benefits of competition in boosting quality and efficiency should not be ignored.

Third, there are several important prerequisites and necessary conditions common to both approaches. These include establishing social support programmes, eliminating direct heat production subsidies, instituting legislation and mechanisms to enforce good payment discipline, installing meters and controls, developing policies to promote demand-side energy efficiency and removing barriers to wholesale competition.

Fourth, if a country decides to regulate prices, an independent regulator, least-cost planning and full cost recovery are essential. An independent regulator must ensure impartiality and separate tariff setting from short-term political goals. Least-cost planning is a way to give regulators enough information to ensure that costs are as low as possible and to avoid unnecessary investments, while at the same time providing for investment in new capacity and other improvements over the long term. Full cost coverage means that district heating companies will be able to survive in the long term. Policy makers and regulators should avoid cost-plus regulation. In most cases, other regulatory approaches, like price capping with efficiency indexes, benchmarking, or long-term competitive concession agreements can create stronger incentives for improving quality and efficiency. Also, regulations should include clear rules on allocating costs to heat in cogeneration plants, particularly when electricity markets are liberalised.

Fifth, if a government decides to use competition to balance supply and demand, it should make sure that competition between various heat sources is fair. Fair competition means no producer subsidies for any competing form of energy. It also means that companies should be able to take action against customers in arrears, since non-payment creates an implicit subsidy. If a government decides to liberalise one part of the energy sector, it should seriously consider liberalising district heating as well to avoid market imbalances. High levels of poverty can also create a barrier to a balanced market because of the difficulties the poor face in paying the capital costs of switching to a local boiler. Social programmes, rather than producer subsidies, are a better and more comprehensive way to address poverty.

Sixth, governments should take advantage of competitive bids for new supply to lower costs in a regulated context. In larger cities, a more comprehensive approach to wholesale competition can help lower costs and ensure adequate supply long term.

Seventh, transparency is very important regardless of whether the policy for balancing supply and demand is based on competition or regulation. This starts with policy transparency. Draft regulations and laws should be open for public review and discussion before they are adopted. This can enhance the quality of these documents and ensure that they consider the needs of all stakeholders, not just producers. The same holds true for tariff and investment approvals as well as local energy plans. In addition, governments should actively work to stamp out corruption in all sectors, including district heating.

And finally, countries should be proactive in policy-making. They should not be afraid to touch district heating and to work hard to get the policy right.

