

Policies and Barriers for DHC outside EU Countries

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REDUCE, RECYCLE, REPLACE: DOUBLING DHC NOW!

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Objectives

Identify and review barriers and best practices for sustainable development of DHC in order to:

Facilitate an expansion of DHC systems outside the EU countries in order to:

- increase global energy efficiency,
- mitigate climate change through reduced carbon dioxide emissions, and
- increase national security of supply.

Country specific issues

Features and extent of DHC/CHP

- *DHC and CHP market shares,*
- *Types of consumption: DHW, SH, water/steam*
- *Selected technologies with customer connections,*
- *Heat metering rate,*
- *Market expanding/shrinking*

Development Strategy and Policies

- *National strategy and policy regarding DHC and CHP*
- *Market competition and alternative heating modes*
- *Market drivers/barriers*
- *Energy pricing policy (DH vs. other energy media, differences in price regulations and subsidies, price distortions, restrictions of usage)*

Country specific issues (continued)

Control, supervision and regulation of DH sector

- ▶ *Analysis of the role of the various governmental entities and the municipalities*
- ▶ *Tariff setting (Regulated or not regulated, regulator on municipal/regional/centralised level, only residential/all consumer groups, only DHC)*
- ▶ *Heat planning (does it exist, is it part of urban planning, indicative or mandatory planning, covers mainly the technical development but also some financial aspects)*
- ▶ *Subsidy systems*
- ▶ *Investment support*
- ▶ *Operation and management of DH*
- ▶ *Customer protection/motivation*

Country specific issues (continued)

DH Legislation and Regulations

- ▶ *Identification of laws and regulations, basic features of stipulation*
- ▶ *Organisation and role of the regulator*
- ▶ *Status, rights and responsibilities of customers regarding DHC*
- ▶ *Status, rights and responsibilities of DHC and CHP utilities/companies*
- ▶ *Status of third party access in power (and heat) production*

Tariffs

- ▶ *Tariff setting process*
- ▶ *Cost allocation of CHP including emission fees*
- ▶ *Availability of lump sum/one-tier/two-tier tariffs*
- ▶ *Tariff development policy*
- ▶ *Connection/disconnection fees*

Country specific issues (continued)

Taxes and Subsidies

- ▶ *Fuel, heat and electricity taxes*
- ▶ *Subsidies to customers*
- ▶ *Investment subsidies to DHC /CHP*

Social Considerations

- ▶ *Social assistance programs to allow low-income households to pay for heating*
- ▶ *Other fuel related poverty problems in market and transition economies*
- ▶ *Satisfaction regarding heating quality*

Investment Climate

- ▶ *Governmental support/barriers*
- ▶ *Municipal support/barriers*
- ▶ *Rights of investors*
- ▶ *Financing sources*
- ▶ *Tariff components and cost coverage*

Countries selected

- ▶ Bosnia & Herzegovina (BiH)
- ▶ Canada (CAN)
- ▶ China (CHI)
- ▶ Croatia (CRO)
- ▶ Kazakhstan (KAZ)
- ▶ Kosovo (KOS)
- ▶ Macedonia FYR (MAC)
- ▶ Russia (RUS)
- ▶ Serbia (SER)
- ▶ South Korea (KOR)
- ▶ Ukraine (UKR)
- ▶ USA (USA)
- ▶ Uzbekistan (UZB)

These countries cover more than 70% of all DH in the world and 95% of DH outside the EU.

Summary of findings

	BiH	CAN	CHI	CRO	KAZ	KOS	KOR	MAC	RUS	SER	UKR	USA	UZB
Building regulations with EE	y	y	y	y	y	y	y	y	y	y	y	y	n
DH prices regulated	y	n	y	y	y	y	y	y	y	y	y	n	y
Main competitor	Gas	Gas	none	Gas	El/gas	El	LNG	EL	none	El	Gas	Gas	none
Feed-in tariff scheme for RES and/or CHP	y	n	y	y	n	n	n	n	n	y	y	n	n
Emission trading scheme	n	n	n	n	n	n	n	n	n	y	n	n	n
Carbon tax in use	n	n	n	n	n	n	n	n	n	n	n	n	n
Investment grants for DH/CHP	n	n	n	n	n	n	n	n	n	n	n	n	n
DH customer rights (Weak/Strong)	W	S	W	S	W	W	S	W	W	W	W	S	W
DH service quality (Good/Poor)	P	G	P	G	P	P	G	G	P	P	P	G	P
Billing based on consumption	n	y	n	y	n	y	y	y	n	n	n	y	n
Municipal role (Weak/Strong)	W	W	W	W		W		W	W	S	W	W	W
Private sector involvement	n	y	y	n	y	n	n	y	n	n	n	y	y
Synergy allocations: CHP/Res													
Integrated resource planning	n	n	y	y	n	n	y	y	n	n	n	n	n
Heat planning and zoning	n	n	y	n	n	n	y	y	y	n	n	n	y
Technical standards	New	New	New	New	Old	New	New	New	Old	New	Old	New	Old
Refurbishing strategy in use	y	n.a.	y	y	y	y	n.a.	y	n	y	n	n.a.	n
DHW supplied with DH	n	y	n	n	y	n	y	n	y	n	y	y	y

Explanations: n=no, y=yes, EL=Electricity, W=Weak, S=Strong

Focus of the presentation:

- DH Regulation
- DH pricing and billing
- CHP

DH Regulation

- Special DH regulation is typically not applied in competitive heat markets (most old EU member countries, USA, CAN).
- In countries of the former Soviet Union and China, DH regulation has emerged from the former centralised systems.
- In former Yugoslavia different systems have been developed
- In most of these countries, centralised regulatory bodies address DH (exemptions , e.g., China, Serbia).
- DH regulation copies typically essential elements of Electricity Regulation, despite the obvious differences.

Current status

	KAZ	RUS	UKR	UZB	
Central national DH regulator	yes	yes	yes	yes	
Central governmental	yes		yes	yes	
Municipal					
Central-regional-municipal		yes			
Private					
	BiH	CRO	KOS	MAC	SER
Central national DH regulator	no	no	yes	yes	no
Central governmental	no	no	yes	yes	
Municipal	yes	yes			yes
Central-regional-municipal					
Private					
	CAN	CHI	KOR	USA	
Central national DH regulator	no	no	yes	no	
Central governmental			yes		
Municipal					
Central-regional-municipal		yes			
Private	yes			yes	

Findings and conclusions

- Centralised regulations are characterised by:
 - Uniform rules should apply to all DH Companies.
 - Tariffs are determined on the same cost base
 - Trained staff in regulatory bodies is available

Decentralised (municipal) regulations are characterised by:

- Lacking uniform rules
- Large tariff discrepancies and price distortions
- Municipalities are often overcharged with regulatory
- Lacking/few trained staff in regulatory bodies
- Danger that DH becomes the playing field for local politics

Conclusions and recommendations

- DH regulation is needed in absence of competitive heating alternatives
- Apply uniform rules for all DHC
- Supervisions (i.e., proper application of rules) can be exercised either by central or local entities
- Regulation should cover at least:
 - Determination of cost base
 - Tariff setting
 - Licenses
 - Rules for operation and management (stipulated in licenses)

DH pricing and billing – current status

	KAZ	RUS	UKR	UZB	
Billing based on consumption					
DH prices regulated	yes	yes	yes	yes	
	BiH	CRO	KOS	MAC	SER
Billing based on consumption		yes	yes*	yes	
DH prices regulated	yes	yes	yes	yes	yes
<i>* mandatory by law, but not yet enforced</i>					
	CAN	CHI	KOR	USA	
Billing based on consumption	yes		yes	yes	
DH prices regulated		yes	yes		

Consumption-based billing

In most countries of this group, billing used to be done based on lump-sum tariffs (usually, Curr. Unit/m²),

- Advantage: simplicity both for DH operators and customers
- Disadvantage: Lacking incentive to save energy and reduce costs.

Converting this system to consumption-based billing in China subject of the so-called „Heat reform“.

In other countries, the initiative has typically come from the DH Companies, when facing increasing competition from other heating options.

Consumption-based billing

There is a clear tendency to implement consumption-based billing.

- In China the central government pushes consumption-based billing, but implementation at the local level is slow.
- In the countries of the former SU, consumption-based billing is allowed, but typically neither enforced nor actively supported by local authorities.
- In MAC and CRO it is applied, in KOS legally requested but not yet applied. In SR, most DH Companies want it, but local authorities are still resisting.
- Consumption-based billing is typically applied in CAN, KOR, and USA.

Good practice - Kosovo

- Consumption-based billing is legally requested (but not yet enforced due to lack of meters)
- A two-part tariff is applied (even without metering)
- Tariff calculated based on cost and demand forecast
- Clear rules for cost-base
- Profit included (return of regulated assets base)
- **ERC** explains in detail reasons for not accepting specific costs
- Losses and profits of the previous year affect the approved cost base of the current year.
- But: Bad debts are not accepted as costs

DH Pricing and billing- Recommendations

- In regulated DH markets, uniform pricing rules need to be applied (good example: Kosovo)
- Decentralised pricing responsibilities lead to price mismatch and price distortions (such as in Serbia)
- A decentralised variant would comprise (recommended option for China):
 - Definition of uniform rules for cost base, tariff setting and billing,
 - Local/regional supervision of proper application of the rules
- Application of a two-part tariff reflecting variable and fixed costs (particularly important for economies in transition)

CHP – Current status

	KAZ	RUS	UKR	UZB	
Feed-in tariff scheme for CHP with fossil fuels					
Feed-in tariff scheme for CHP with RES					
Investment grants for CHP					
DHW supplied with DH	yes	yes	yes	yes	
	BiH	CRO	KOS	MAC	SER
Feed-in tariff scheme for CHP with fossil fuels		yes			yes
Feed-in tariff scheme for CHP with RES	yes	yes			yes
Investment grants for CHP					
DHW supplied with DH					
	CAN	CHI	KOR	USA	
Feed-in tariff scheme for CHP with fossil fuels					
Feed-in tariff scheme for CHP with RES		yes			
Investment grants for CHP					
DHW supplied with DH	yes		yes	yes	

Status of CHP

Shares of CHP in total heat generation capacity is different, but in general sub-optimal.

The biggest markets are:

- China (2006): 2,600 CHP units with over 80 GW of capacity, providing about 18% of the thermal generation capacity
- Russia: Heat supplied by CHP amounts to some 30%
- In CEE, conditions for CHP are difficult:
 - Ukraine: Many old CHP plants have shrunk to heat only boiler plants due to technical problems
 - Serbia: Most CHP plants have stopped production

Problems of CHP utilisation

- Nation-wide average numbers say nothing about the rationale of CHP utilisation.
- In some cases, practically all heat may come from CHP (e.g., Ulan Bator/Mongolia), i.e., the share of CHP in total capacity may be far above economic optimum.
- In China, there can be hundreds of DH Companies in one city, while only a few are served by CHP.
- In Russia, there is little incentive to develop any CHP. Therefore, the outdated CHP performance is close to modern pure power (condensing) plants.
- In general, there are no clear opinions and guidelines regarding the optimal sizing of CHP.
- Steam is usually extracted at relative high pressures resulting in unnecessary electricity losses.
- Typically low overall efficiencies
- There are only a few examples of reasonable heat planning for cities.

Good practice – Skopje/MA

- Ownership and regulatory functions clearly separated
- DH is owned by a private investor
- Network is owned by Municipality and leased to DHC
- Licenses for generation, distribution, and supply
- Rehabilitation without funds from IFIs
- High collection rate of 95%
- New CHP CCP plant; more are planned to supply the whole system.
- Heat from CHP cheaper than from HoB (but no feed-in tariff system)

CHP – Promotion

- Promotion of CHP is mostly limited to small plants (typically up to 10 MWe) using RES and, sometimes, natural gas.
- This has obviously been promoted by the corresponding EU policies and is applied by potential EU members.
- China has adopted a **less vigorous** approach, which actually does not promote small scale CHP with RES.
- There are no particular promotion programmes to support larger CHP plants.
- Clear policies and transparent rules for operating larger CHP plants are mostly lacking.

CHP - Recommendations

- DH Companies and government are mostly looking for private investors, but transparent and clear legal frameworks are missing; rules are fixed case by case
- Clear and transparent feed-in tariff systems for CHP (including larger facilities) required
- Sizing the plants needs to be based on reasonable heat planning (instead of outdated norms)
- Heat planning is mostly not applied or became a forgotten art (FY).

Additional information

The report will be publically available by summer 2011 at <http://www.iea-dhc.org/>

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