The background of the slide is a photograph of an industrial facility, likely a power plant or refinery. It features a complex network of silver-colored pipes, large blue-handled valves, and various pieces of machinery. The lighting is bright and even, highlighting the metallic surfaces. The overall color palette is dominated by blues, greys, and silvers, with a white curved graphic element at the bottom.

# Overview of DH pricing and regulation in Europe

Riga, December 4<sup>th</sup> 2012

Fortum, Heat Division  
Harri-Pekka Korhonen

# District heating regulation regimes vary across Europe

## Should EU have a role to drive transition towards regulated or liberalized heat markets?

### Regime categories

**DH company sets competitive prices** while competition authorities monitor excessive profits based on competition law

**Alternative-based heat pricing** as main pricing principle to promote DH against other heating solutions

**Heavy-touch ex-ante price control** based on established methodology and approval of autonomous regulator

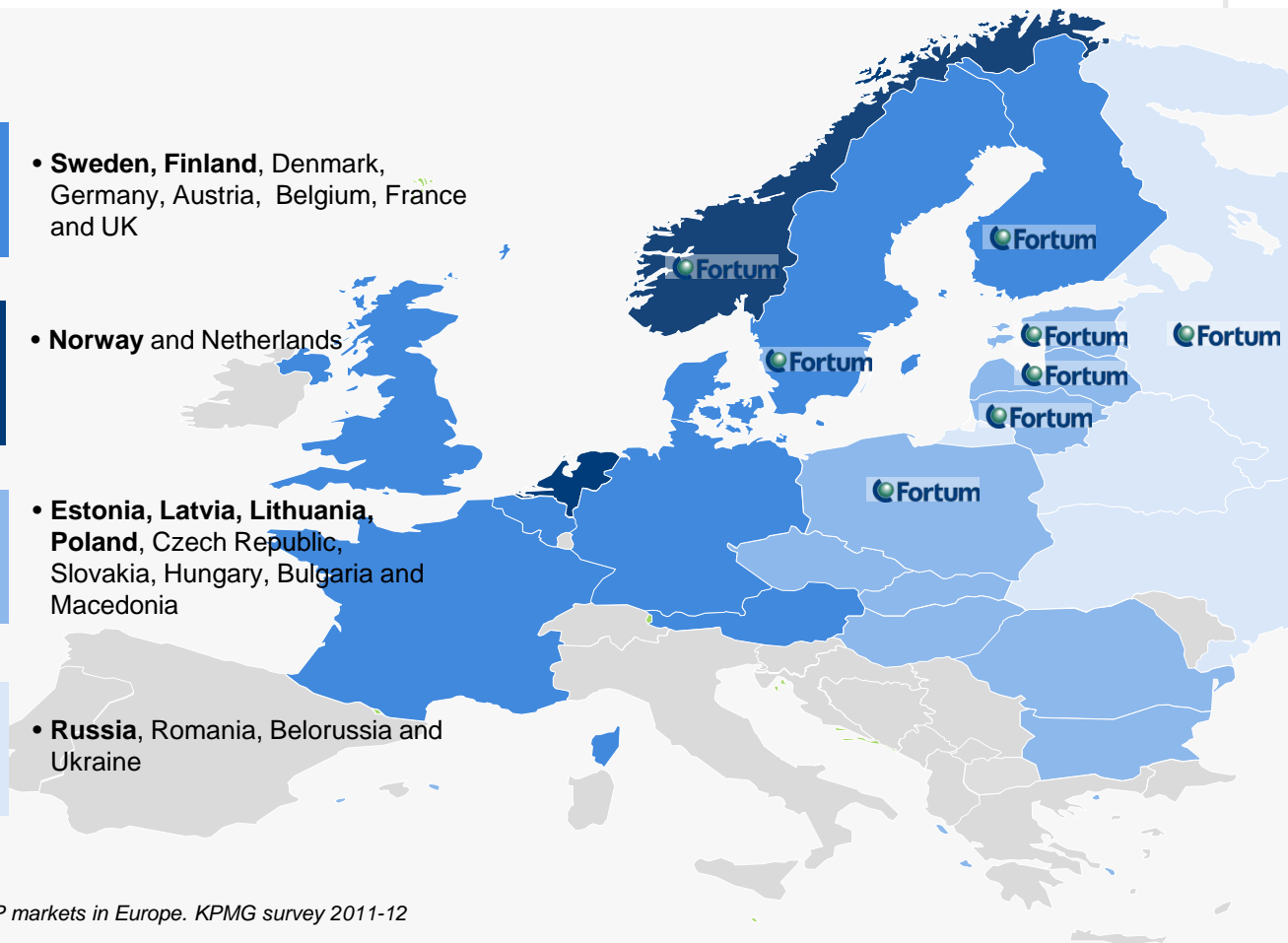
**Heavy-touch ex-ante price control** based on multi-level approval by state, regional and local authorities

• **Sweden, Finland**, Denmark, Germany, Austria, Belgium, France and UK

• **Norway** and Netherlands

• **Estonia, Latvia, Lithuania, Poland**, Czech Republic, Slovakia, Hungary, Bulgaria and Macedonia

• **Russia**, Romania, Belorussia and Ukraine



Source: Fortum analysis based on benchmarking selected DH/CHP markets in Europe. KPMG survey 2011-12

# Split rationale of the regulator – duty of economic regulation is to fix market failures where sufficient competition does not exist

## **Rationale to liberalize heat markets** ↔ **Rationale to regulate heat markets**

- **The best regulator is the functional relevant market.** The regulator can never be as efficient as effective competition. It is more efficient to avoid market dominance than to introduce regulation.
- **Customers should have the freedom of choice between different heating alternatives.** When there are technical limitations for this choice, also customers living in city centers can take benefit of competition when DH is priced on equal and transparent way.
- **EU energy policy drives for liberalization of electricity and gas market. Similar policy objective could be applied to heating markets as well** but special consideration needs to be taken i.e. definition of relevant market and mechanisms to enhance competition.
- **In functional market the risks basically increase which also increases the volatility of profits.** But this risk exposure should be symmetric which means that the best companies and products should earn higher than average profits.
- To succeed in liberalized heat markets a DH company should take **full economical and operational responsibility** of its actions and results. This also means that it should have an incentive to always seek for lowest cost heat production sources i.e. industrial waste heat.

- **Regulation is needed when competition is limited** or when there is evidence from misuse of market dominance. Market dominance can be due to different reasons i.e. obligatory connection rules or superiority of DH product. Customer preferences change over time which may change the dynamics of local heating market i.e. heat pump for heating and cooling is becoming more competitive.
- **Statutory duty of regulation is to fix market failures in district heating**
  - Barriers and lack of potential effective competition
  - Inefficiency of asset utilization, operations and new sales
  - Barriers for new energy efficient (sustainable) investments and for maintaining capital requirements
  - Customer negligence and poor quality of security of supply
  - Strong linkages between energy and social policy
  - Abuse of market dominance – excess profits
- **Creating predictable and transparent rules for improved functionality and competitive price formation for district heating**
  - Artificially too low DH price may give incorrect signal not to save energy
  - Competitive heat pricing linked with cost-plus pricing
  - Predictable economic incentives for performance improvements
  - Political independence
  - Regulatory stability

Heating market model: DH competes with alternatives

Heating market model: single-buyer vs. network access

Competitive heat markets and pricing

Economic regulation to maintain capital requirements

Complexity and costs increase

# Local heating market where DHC competes with alternative solutions should be deemed as 'relevant market'

- Assessment of competitive conditions is made within the scope of relevant market under EU competition legislation.
- Local heating markets as 'relevant market' whereas heating customers (building owners) are making a selection between various alternatives.

In competition law the Relevant market defines the market in which one or more goods compete. Therefore, the Relevant market defines whether two or more products can be considered substitute good and whether they constitute a particular and separate market for competition analysis.

The relevant market combines the product market and the geographic market, defined as follows:<sup>[1]</sup>

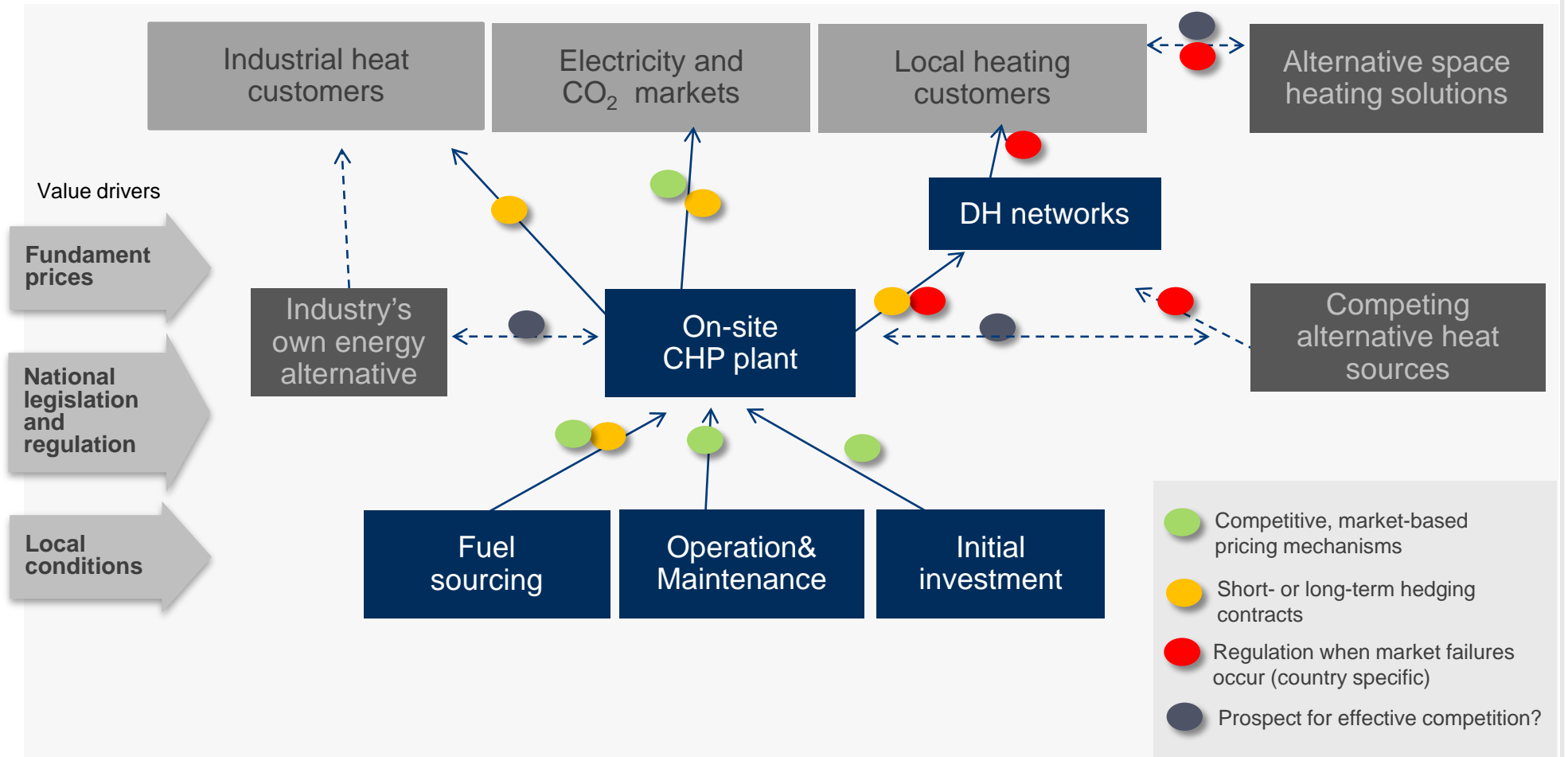
A relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer by reason of the products' characteristics, their prices and their intended use;

A relevant geographic market comprises the area in which the firms concerned are involved in the supply of products or services and in which the conditions of competition are sufficiently homogeneous.



# Competitive district heating

## Hedging and system optimization is critical





# Heat pricing from CHP – varying degree of electricity market liberalization and price formation methodologies

**Unbundled, liberalized electricity markets**

- Sweden, Norway and Finland

**Electricity markets to be fully unbundled and liberalized**

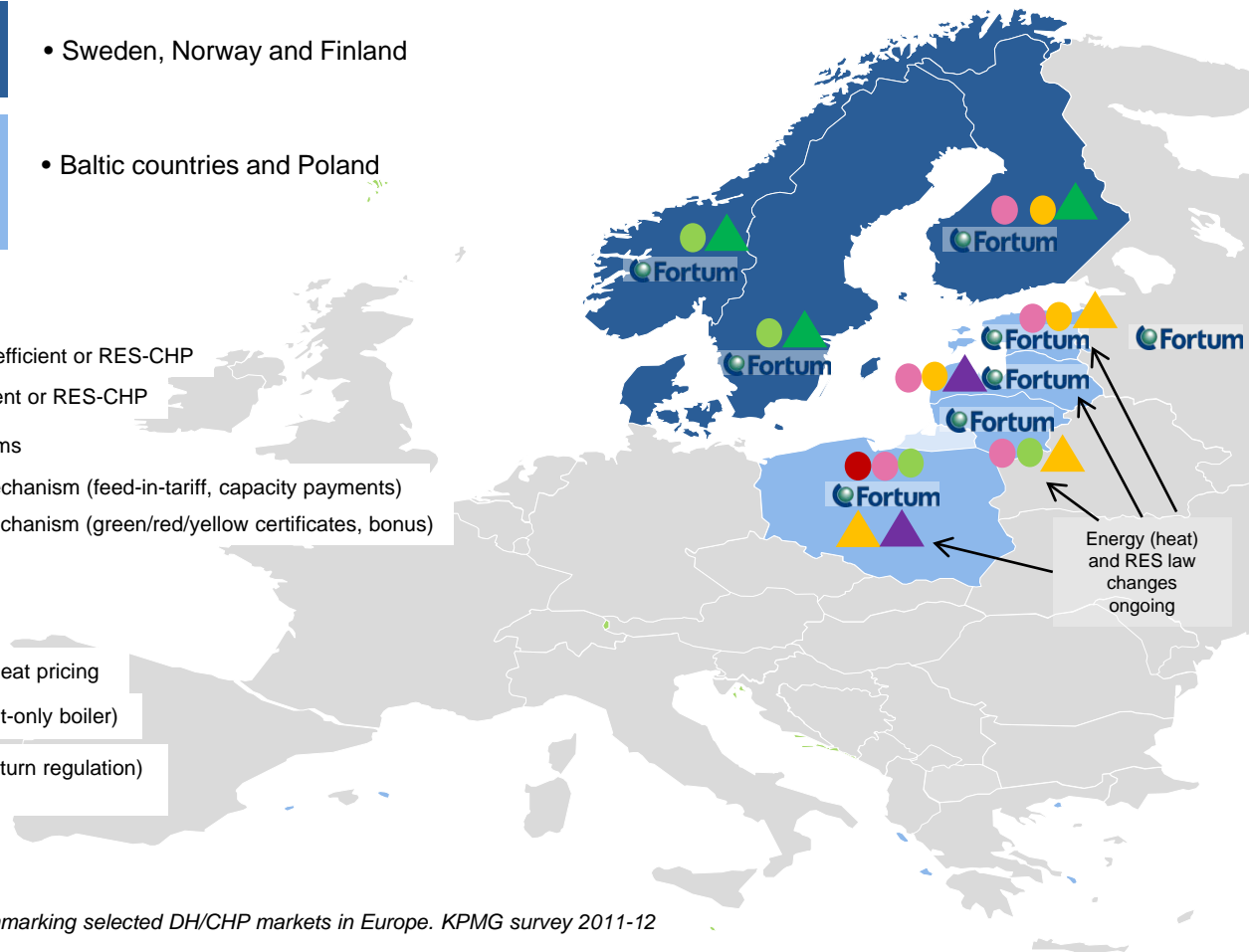
- Baltic countries and Poland

## Incentive mechanisms

- Mandatory electricity off-take from efficient or RES-CHP
- Mandatory heat off-take from efficient or RES-CHP
- CHP investment support mechanisms
- CHP electricity revenue support mechanism (feed-in-tariff, capacity payments)
- CHP electricity revenue support mechanism (green/red/yellow certificates, bonus)

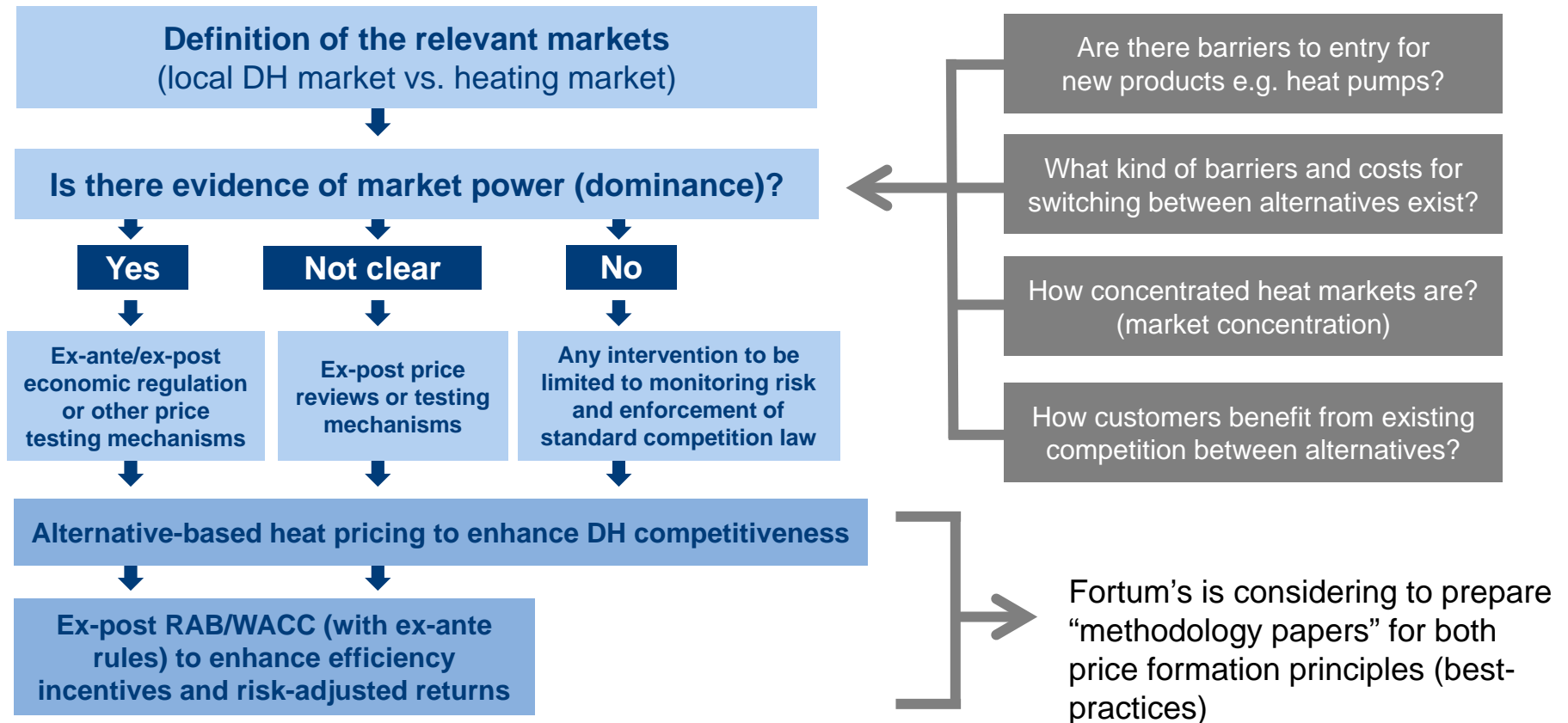
## Heat pricing from a CHP

- ▲ Competitive and cost-reflective heat pricing
- ▲ Cost-plus pricing (alternative heat-only boiler)
- ▲ Cost-plus pricing (full or partial return regulation) "RAB/WACC"



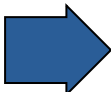
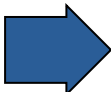
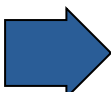
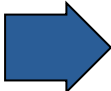
Source: Fortum analysis based on benchmarking selected DH/CHP markets in Europe. KPMG survey 2011-12

# Economic principles for assessing case for regulating DH



In transition economy countries (Eastern Europe) the rationale for regulation is also due to the governments past role as price setter. In Norway and Netherlands where DH is fully competing with existing other heating forms, it has been natural to take alternative-based heat pricing as primary pricing methodology.

# Dive-deep into various regime categories – heavy-touch ex-ante Perspective of the regulator

	Estonia	Latvia	Lithuania	Poland
<b>Primary legislation concerning DH/CHP</b>	District Heating Act 2003 Electricity Market Act 2003 RES promotion Act 2009	Energy Law 1998 Electricity Market Law 2005 Law on regulators 2000	Law on Heating Sector (2003) RES law (2011)	Energy Law (1997) draft Energy/RES/Gas Laws (2012)
<b>Secondary legislation</b>	At least 8 other degrees	At least 4 other degrees	About 11 other laws, degrees and resolutions	Several ordinances
<b>Regulatory body</b>	Estonian Competition Authority ( <b>ECA</b> )	Public Utility Commission ( <b>PUC</b> ) and local municipality	National Commission for Prices and Energy ( <b>NCCPE</b> ) and local municipality	Energy Regulatory office ( <b>URE</b> ) through 8 regional offices
<b>Legal rationale for DH price control</b>	DH is having a dominant market position	DH is having a dominant market position	Protection of customers; partial liberalization of heat production	Protection of customers; partial liberalization of heat production
 <b>Key methodology – DH networks</b>	“RAB/WACC”	“RAB/WACC”	“RAB/WACC”	“RAB/WACC” / “RPI +/- x”
 <b>Key methodology – heat from CHP</b>	Alternative heat-only boiler with same fuel mix	“RAB/WACC”	Alternative heat-only boiler (not regulated for independent heat producer, IHP)	Reference price (cost of alternative heat-only boiler with same fuel mix calculated by URE) or “RAB/WACC”
 <b>Risk profile benchmark of DH/CHP</b>	Gas sector	Water sector	Water sector	Electricity distribution
 <b>Overall conclusions</b>	<ul style="list-style-type: none"> <li>• <b>Politically independent</b> regulatory bodies in place</li> <li>• <b>Comprehensive assessments for developing heating market model and pricing have not been done</b></li> <li>• <b>Resource consuming:</b> Rather heavy legislation and related secondary legislation; burdensome tariff negotiation process</li> <li>• <b>Basic regime of economic regulation to secure capital maintenance is recognized</b> but mechanisms are not well-developed when compared to international regulatory best-practices i.e. regulatory objectives and tariff validity periods</li> <li>• <b>High regulatory discretion</b>, specially in Poland, to enhance customer protection</li> </ul>			

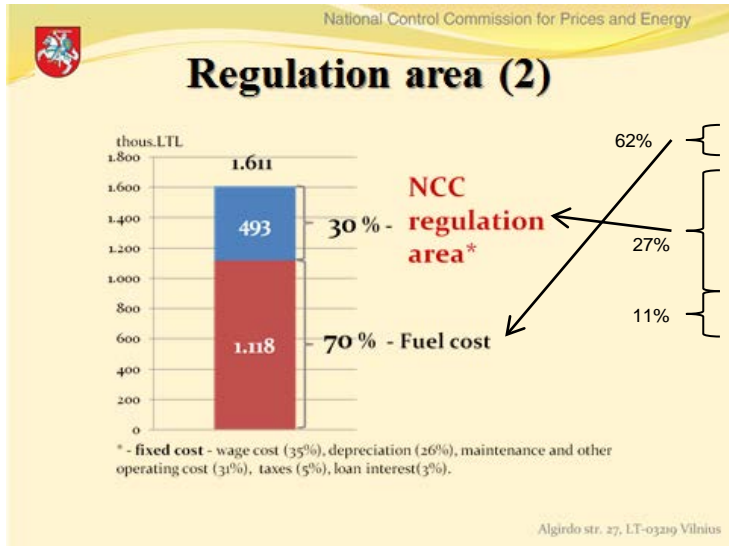


# Dive-deep into various regime categories – heavy-touch ex-ante

## Perspective of the DH operator

	Estonia	Latvia	Lithuania	Poland
Length of tariff approval process	4-6 months	About 4 months	About 5 months	3-5 months
Degree of regulatory discretion	Heat price formation methodology is transparent	Heat price formation methodology is transparent but complicated	Heat price formation methodology is transparent but complicated	Heat price approval is diversified into 8 regional URE offices (no consistent methodology)
Risk profile benchmark of DH/CHP	Gas sector	Water sector	Water sector	Electricity distribution
Is over-performance incentivized?	NO	NO	NO but underperformance is penalized	NO but underperformance is penalized
Is sustainable heat production incentivized?	NO	NO	YES	Mandatory heat-off take is considered
Is sustainable electricity production incentivized?	Feed-in-tariff (changes upcoming)	Capacity payment (to be revised?)	Feed-in-tariff (to be revised?)	Certificate system (under full revision)
Overall return allowance for heat	0 - 8,5 %	0 - 8 %	0 % - 8 % (RES-H +1 %)	Company specific
Overall conclusions	<ul style="list-style-type: none"> <li>• <b>Lengthy tariff setting processes</b> compared to the fact that less than 30 % of total OPEX is controllable by regulator</li> <li>• <b>Risk of DH/CHP is not comparable</b> with sectors having a natural monopoly driven by technology limitations</li> <li>• Complex heat market model in Poland (network access model)</li> <li>• <b>Certain degree of unpredictability and inconsistency</b>, specially in Poland</li> <li>• Discretionary return allowance in Poland</li> <li>• <b>Lack of effective and sufficient incentives for continuous improvements in heat business</b></li> </ul>			

# Regulatory heavy-touch has marginal impact on heat prices



Cost specification, EUR/MWh	Cost structure	Current price	New price, NCCPE	New price, company	New price, company
Benefit sharing			100%/0%	50%/50%	100%/0%
Fuel costs	62%	39,2	38,5	37,3	37,3
Staff costs	9%	5,9	5,3	4,7	4,7
O&M	8%	5,2	5,0	4,7	4,7
Taxes	1%	0,8	0,8	0,8	0,8
Depreciation	7%	4,4	4,4	4,2	4,2
Loan interest	1%	0,7	0,7	0,7	0,7
Return on equity	2%	1,3	1,3	3,3	1,3
VAT	9%	5,7	5,5	5,2	5,2
<b>Total price</b>	<b>100%</b>	<b>63,0</b>	<b>61,3</b>	<b>60,9</b>	<b>58,9</b>
<b>Price improvement potential</b>			<b>-2,7%</b>	<b>-3,3%</b>	<b>-6,6%</b>

**Assumed efficiency potential**

NCCPE (1)	Company (2)	
		between customers and DH company
2%	5%	Production efficiency and network efficiency
10%	20%	Reduction of staff
5%	10%	Optimization of short- and long term O&M costs
0%	0%	Non-controllable
0%	5%	More effective investments
0%	0%	Non-controllable
0%	0%	Controllable
0%	0%	Non-controllable

(1) Assumed that NCCPE has limited tools to incentivize cost efficiency improvements. Not effective only through cutting max cost of capital (for municipal companies).

(2) Assumed that DH company has financial incentive to make cost efficiency improvements

Source: Baltic Utility Fortum, January 2012. DH and water regulation in Lithuania, Public Utilities Commission of Lithuania. Ms Vilma Skinderyte

Source: Fortum analysis

- **Analysis is made based on general Lithuanian DH cost structure (dominated by natural gas) presented by NCCPE**
  - Fuel costs represent over 60 % of end-customer price
  - Regulatory heavy-touch concerns less than 20 % of operational cost expenditure (other OPEX)
  - Depreciation 7 % can be affected only through decreased capital expenditure (CAPEX) in the future
- **Improvement of production and networks efficiency requires also new investments and long-term financing**
- **In best case, regulatory heavy-touch can reduce heat prices by 2 %...3 %**
  - Assuming fuel efficiency improvements also
- **If DH company is having clear incentive for higher efficiency, expected price impact can be 3 %...6 %**
  - Benefit sharing 50/50 would impose similar price reduction as heavy-touch regulatory intervention
  - Rationale to invest in more stable local fuels i.e. biomass are not assessed

## Back-up slides

## Overview of DH regulatory developments

# Collection of various quotations and presentations

	Estonia	Latvia	Lithuania	Poland
<b>Energy policy objectives</b> (ministry level statements)	<ul style="list-style-type: none"> <li>• Positive towards gradual de-regulation</li> <li>• Too high prices in some locations</li> </ul>	<ul style="list-style-type: none"> <li>• RES law and notifications</li> </ul>	<ul style="list-style-type: none"> <li>• Revision of heat law? (i.e. mandatory unbundling)</li> <li>• Heat price formation methodology under consultation</li> <li>• RES law and notifications</li> </ul>	<ul style="list-style-type: none"> <li>• Draft energy and RES laws</li> <li>• Relevant ordinances upcoming</li> <li>• URE consultation on "return on capital and simplified tariff setting"</li> <li>• Government objectives somewhat unclear although incorporated in draft laws</li> <li>• Reservation for non-regulation if certain conditions can be met (location specific)</li> </ul>
<b>Regulatory approaches towards future heat markets</b>	<p>POSITIVE TO GRADUAL LIBERALIZATION "The best regulator is the market. The regulator can never be as efficient as market." Regulation is needed where competition is limited. It is more efficient to avoid market dominance, than to introduce regulation"</p>	<p>REGULATION OF HEAT PRICES "AS IS"</p>	<p>REGULATION OF HEAT PRICES "AS IS" NON-REGULATION OF INDEPENDENT HEAT PRODUCERS</p>	<p>REGULATION OF HEAT PRICES "AS IS" NON-REGULATION OF CHP PRODUCERS WHICH BEAT THE REFERENCE PRICE CAP</p>
<b>Topical regulatory objectives</b> (based on public sources and individual discussions)	<ul style="list-style-type: none"> <li>• No general need for DH zoning policy</li> <li>• Obligation for municipalities to prepare a comprehensive plan</li> <li>• DH zoning + price regulation if DH is sustainable option</li> <li>• Decrease share of natural gas in DH production</li> <li>• Increase DH competitiveness in small locations (even free competition)</li> <li>• Light-touch ex-post type of regulation could be introduced</li> <li>• Reduce number of regulated companies</li> <li>• Higher energy efficiency for heat generation</li> <li>• Network losses &lt; 15 % by 2017</li> <li>• Cost savings for operational losses</li> <li>• Tougher regulation of large, private DH operators</li> </ul>	<ul style="list-style-type: none"> <li>• New heat law will be developed along with revised energy strategy and policy</li> <li>• Open for development of heat price formation methodologies</li> </ul>	<ul style="list-style-type: none"> <li>• Gradual regulatory improvements but no major changes are being considered</li> </ul>	<ul style="list-style-type: none"> <li>• Positive towards simplified tariff setting</li> <li>• Mandatory application of reference heat price methodology as price cap for heat from CHP plant</li> <li>• Mitigating heat price increases with a cap defined by RPI</li> <li>• Only gradual allowance of full return on capital during more than 4 years</li> <li>• Defining return on capital similar as for electricity distribution</li> <li>• Considering heat production having lower risk profile than heat distribution</li> <li>• Penalization for inefficiency</li> <li>• Remaining high regulatory discretion by having different adjustment factors i.e. <ul style="list-style-type: none"> <li>• U factor</li> <li>• EWA factor</li> <li>• ...</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Märt Ots: Baltic Utilities Fortum January 2012</li> <li>• Kylli Haab: Workshop October 2012</li> </ul>	<ul style="list-style-type: none"> <li>• Preparations for new energy strategy</li> </ul>	<ul style="list-style-type: none"> <li>• NCCPE consultation process since May 2012</li> <li>• Political initiatives for revision of Heat Law</li> </ul>	<ul style="list-style-type: none"> <li>• URE consultation process since August 2012 and URE's positions for new energy law</li> <li>• Various discussions</li> </ul>

Sources: External presentations, Fortum analysis

# Heating market characteristics

	<b>ESTONIA</b> (Tartu, Pärnu)	<b>LATVIA</b> (Jelgava)	<b>LITHUANIA</b> (Klaipeda, small DHCs)	<b>POLAND</b> (Wroclaw, Czestochowa and Plock)
<b>DH zoning policy</b>	Municipality, voluntary (under reconsideration)	Municipality, voluntary	Municipality, voluntary	Proposed by current law
<b>Typical customers</b>	Housing associations	Individual flat owners	Housing associations/flat owners	Housing associations
<b>Connection procedure</b>	Mandatory when preconditions are met	Mandatory (public buildings) Voluntary (private building zones)	Voluntary	Voluntary
<b>Connection payment</b>	Full investment cost	Partial/full investment cost (company specific)	Free-of-charge (cost to be invoiced through heat tariff)	25 % of connection investment
<b>Disconnection procedure</b>	Difficult (housing association)	Unanimous decision of building	Rather easy (permission from municipality)	Difficult (housing association)
<b>Disconnection payment</b>	Company specific	N/A	None	25 % of connection investment ./. penalty fees
<b>Access to natural gas</b>	Common (~70 % of customers)	Common	Common	Rather common
<b>Most competitive alternative</b>	Individual gas boiler	Individual gas boiler	Individual gas boiler	Individual gas/coal boiler
<b>Emerging other alternatives</b>	Ground heat pump	Ground heat pump	Ground heat pump	Ground heat pump
<b>Market share of DH in new buildings, indicative</b>	N/A	N/A	N/A	N/A

**Local heating markets should be deemed as relevant market in compliance with competition law when need for heat price regulation or reasonability of heat pricing are being considered.**

**Fortum promotes fair and equal competition between district heating and alternatives, and speaks against any lock-ups i.e. DH zoning policy and difficult disconnection procedures.**

# Mechanisms to enhance effective competition between alternative space heating solutions in local heating markets

Are there market barriers to entry for new products i.e. heat pumps?

- Does urban zoning policy exist? (district heating zones)
- Technical barriers may become changed with new technology (solar thermal)
- Tax (VAT, energy taxation) and investment subsidy policies vary between products
- Availability of objective and up-to-date price comparisons (investment/energy costs)

What kind of barriers and costs for switching between alternatives?

- Voluntary and easy connection and disconnection procedure
- It is not economically feasible to switch every year (economical)
- New emerging hybrid solutions may lower technical barriers (technical)
- Availability of objective and up-to-date price comparisons (investment/energy costs)

How concentrated heating markets are?

- Market share in urban areas
- Market share in new buildings
- Has the concentration lead to market abuse?
- Customers benefit from high DH market share (lower capacity costs/GWh)

How customers benefit from existing competition between alternatives?

- Through alternative based and equal pricing all customers can have the benefit from new technology and decreasing cost of alternative heat sources (although new technologies may not be technically feasible in all locations)