Towards higher energy efficiency in Ukraine's district heating sector

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Outline

1. **Introduction**
2. Reasons for inefficiency in the district heating system
3. Policy recommendations

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1. Introduction

Problem:

- District heating (DH) companies have very low energy efficiency resulting in:
  - Economic problem: High cost of heat production
  - Acceptance problem: Consumers are not willing to pay higher tariffs, if production and distribution is wasteful
  - Ecological problem: Emissions high

Objective of this Policy Briefing:

- Analyse what can be done to improve energy efficiency in district heating companies

We concentrate on measures to improve energy efficiency for heat generation and distribution (supply side), demand side measures like temperature control and building insulation are not the subject of this policy briefing

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How important is district heating?

Background statistics district heating

- Large share of households rely on district heating: 39% in 2012
- Including companies and public sector, district heating provides around 60% of Ukraine's heat and hot water needs
- Backbone of DH are 7,000 heat only boilers and 250 combined-heat and power plants (CHP)
- Most of them are fueled with gas: 10.6 bcm of gas consumed by DH in 2011 – almost 20% of Ukraine's total gas consumptions

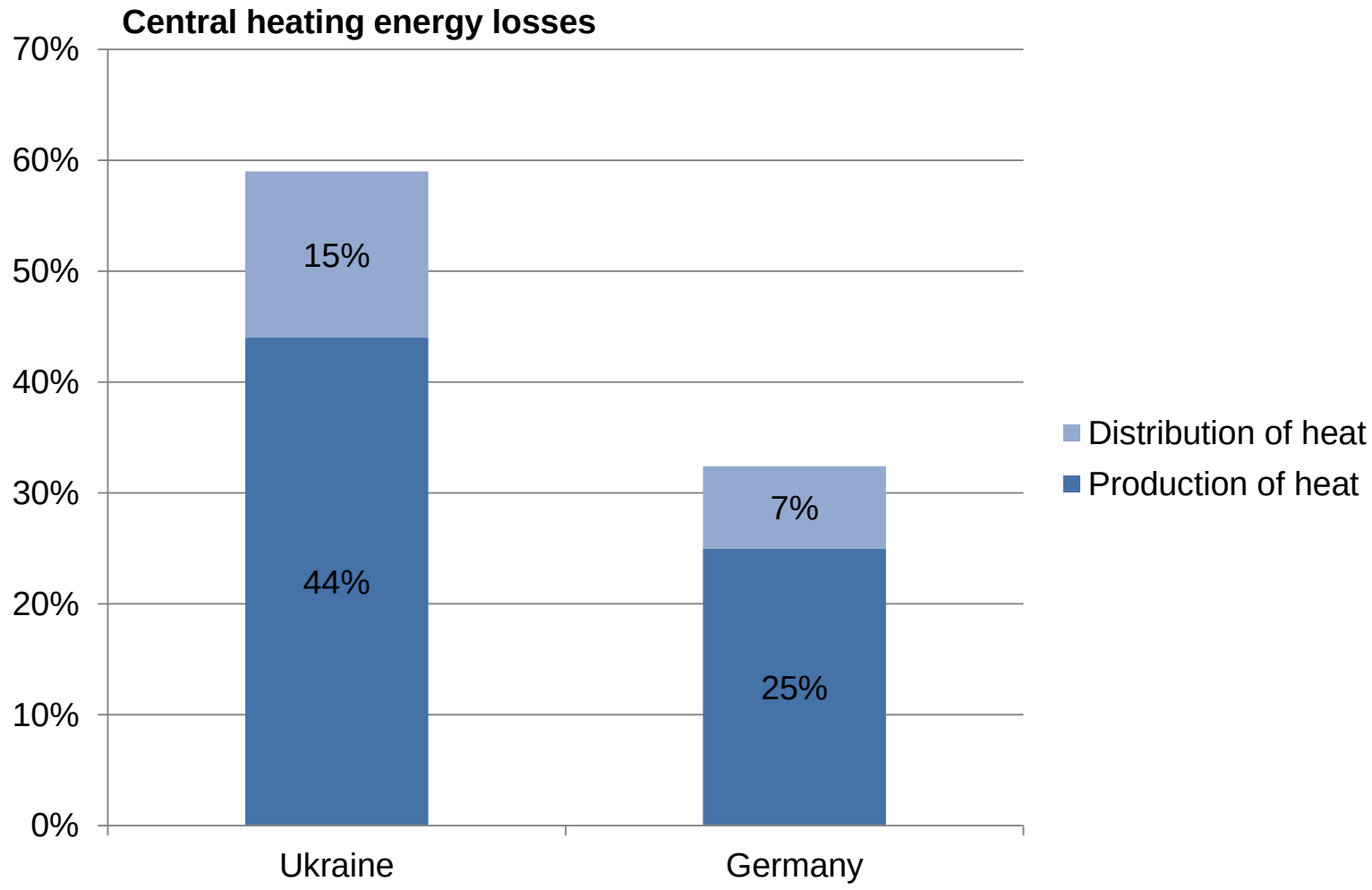
Problem

- An estimated 60% of energy is already lost in the district heating systems during the heat production and distribution process
- Although there will always be losses during production and distribution, the losses in Ukraine system are very high in international comparison

Sources: World Bank, NERC

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Around 60% energy lost during production and distribution



Sources: SAEE, AGEB

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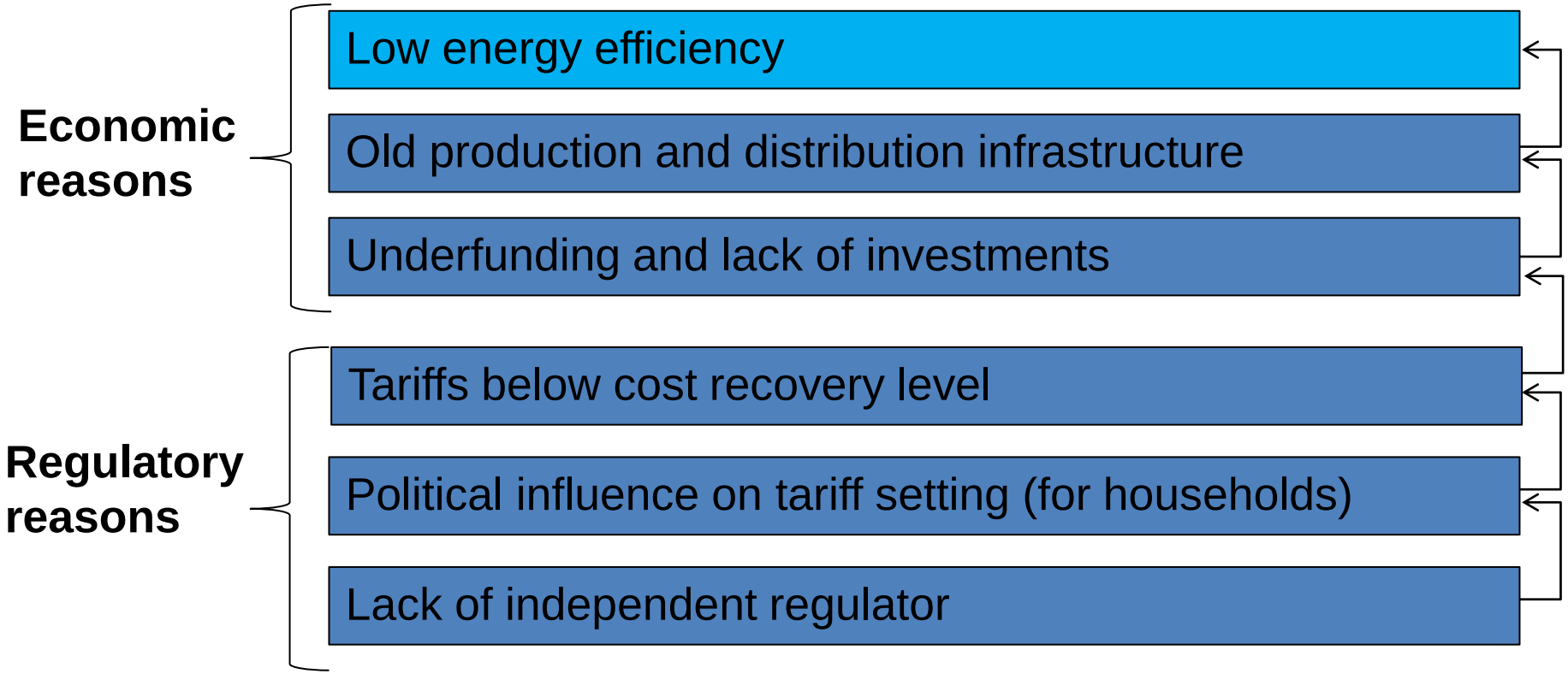
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2. **Reasons for inefficiency in the district heating system**
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2. Reasons for low energy efficiency

- Many factors contribute to inefficiency of Ukraine's district heating system
- Main reason: **Lack of investment**



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Main reason: Lack of investment…

- Lack of investment as heating tariffs do not cover full costs of heat production
- Result: old, deteriorated and inefficient production and distribution equipment
- 90% of equipment above its useful lifetime, 60% even more than double the life time
- World Bank estimates that district heating networks, boilers, combined heat and power plant and thermal power plants require at least USD 1.5 bn investment per year over the next 5 years

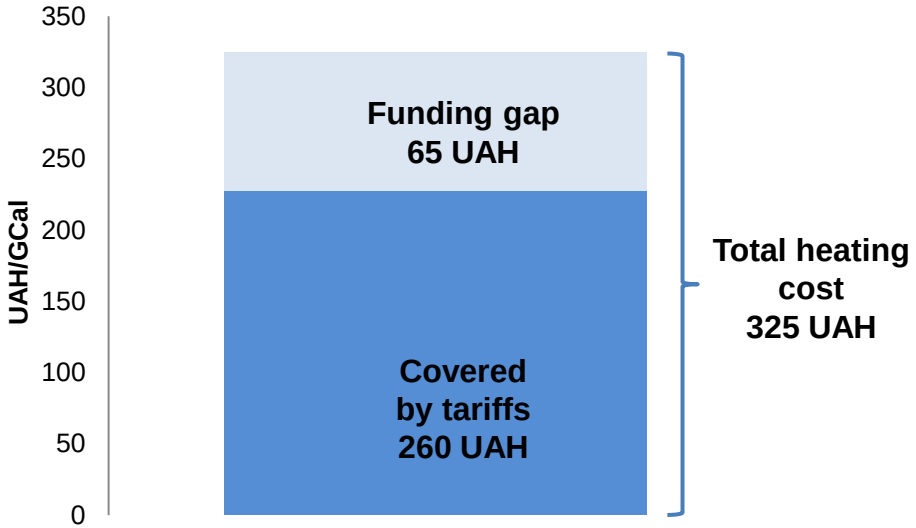
Question: So why are heating companies not investing enough?
→ *Lack of funds due to tariffs below cost recovery level*

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…caused by lack of funds due to tariffs below cost recovery level

- A variety of tariff models exists: fixed, seasonal and two-tier
- Heating costs differ across the regions – typically 1 Gcal costs heating companies 325 UAH
- **Only an estimated 80%** of heating costs are covered by tariffs
- Lack of funds visible in huge payment arrears for gas delivery

Heating expenditure and the funding gap



Source: Information Center of Kryvy Rig City Council, own computation

Question: Why don't tariffs cover the full costs?
→ *Tariff setting process does not work*

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… as tariff setting process does not work

- Currently: *'Cost plus'* tariff setting: Tariffs for individual district heating companies are based on cost and expenditure reported to the regulator
- Theoretically regulator approves 'economically relevant costs'
- In 2011 a new independent national regulator in charge of utility tariff setting was created
- However, tariffs remain below the actual cost of providing heating
- This is either due to costs are not fully approved or tariff setting is politically influenced, or both

Question: What needs to change?

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How to overcome investment back-log

Reason for inefficiency is the lack of investment as heating tariffs do not cover the full costs of heat production

- **Starting point: Tariff increases to allow for investments, necessary requirement for all other steps**
- But risk that money is not used for investment in energy efficiency improvements or used ineffectively for the wrong measures
- How to ensure that tariff increase is actually used for investments in cost-effective energy efficiency improvements?
- Approach: Heating companies can only increase tariffs, if the money is used for approved energy efficiency investments
- Positive side effect: *Acceptance* for tariff increase much higher, if consumers know that money is used to increase energy efficiency measures

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National energy efficiency advisors

Possible approach: **'Energy Efficiency Advisors'**

- Government provides a team of highly qualified energy efficiency experts who audit, advice and approve potential energy efficiency investments of local district heating companies
- Team advices local heating companies, which may not have suitably trained staff to plan, evaluate and carry out energy efficiency measures
- Heating companies are allowed to increase tariffs to cover the cost of these *approved* energy efficiency investments
- Tariff increase is linked to an actual increase in energy efficiency and only if the money is spent effectively
- It would make sense to place the team of *energy efficiency advisors* within the national regulator who would also approve the tariff increase
- Important to have a well-funded team of specialist operating in line with best international practice – make use of international assistance

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Additionally strengthen regulation

- Despite establishing new national regulator, tariff setting has remained flawed
- Thus tariff setting needs to be reformed as otherwise current problems will occur over and over again
- Government needs to ensure that regulator is truly independent – not only on the paper and acts according to best international practice
- ‘Cost plus’ tariff setting needs to consider reasonable investments and repair and maintenance costs
- Consider alternatives to cost plus tariff setting systems for the future (see appendix)

Aim: Protect consumer against too high prices, while enabling district heating companies to cover their cost and have an incentive to invest in energy efficiency measures

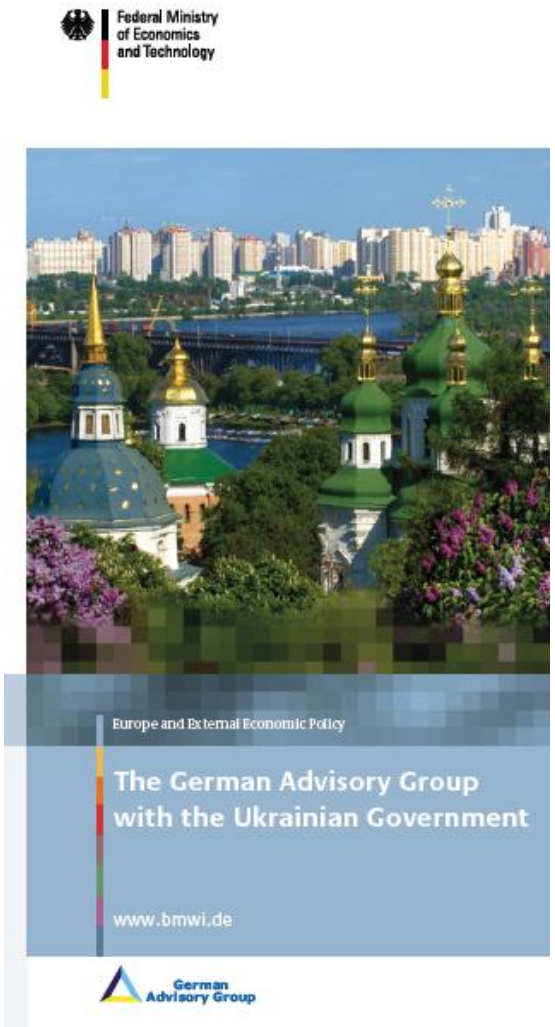
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Appendix

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Tariff setting should promote energy efficiency

Some regulatory approaches are better than others in promoting energy efficiency

Aim: Protect consumers against monopolistic prices, while enabling district heating companies to cover their costs but provide incentives to reduce cost

Alternatives to 'cost plus': Benchmarking, Substitution pricing, Price capping (maximum pricing)

Benchmarking (Competition by comparison)

- Tariffs are set based on average cost of whole industry
- Companies are assessed against their peers, if costs are higher than average benchmarking costs, tariffs will not cover them fully
- DH companies can pocket difference if their costs are below benchmarking tariff → incentive to reduce costs
- Reduces scope for large price differences between companies
- Disadvantage: Factors like regional climate, population density, etc. can influence cost without DH company able to influence

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What are the alternatives to cost plus?

Substitution pricing

- Tariffs are set according to alternative, competing heat sources (e.g. individual gas boilers)
- Advantage: Market-based and incentive to reduce costs
- Problem: Works only if production costs already comparable and other markets undistorted – not the case in Ukraine

Price capping (RPI – X)

- Tariffs are initially set to cover historical costs incl. reasonable return on investment
- Annual tariff increase according to retail price inflation minus a productivity allowance 'X'
- If DH company costs increase below tariff increase → company can keep increase → profits increase → incentive to reduce costs
- Problem: Setting X requires well-informed regulator, energy price spikes that are not fully covered in RPI

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