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# MUNICIPAL HEATING REFORM PROJECT (MHR)

THE REGULATORY POLICY PAPER

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## THE REGULATORY POLICY PAPER

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REGULATION OF COMMUNAL SERVICES IN UKRAINE

POLICY PAPER ON ISSUE AND OPTIONS

Prepared for International Resources Group

Sponsored by USAID

Ashley C. Brown  
Executive Director  
Harvard Electricity Policy Group  
Harvard Kennedy School  
Harvard University

Of Counsel, Dewey & LeBoeuf

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The purpose of this paper is to explore the options for creating a more effective regulatory framework for the District Heating Sector (DH)<sup>1</sup> in Ukraine. The paper will, therefore, focus on four critical regulatory questions:

1. Should regulation be centralized or decentralized?
2. What are appropriate institutional arrangements for regulation?
3. What pricing methodologies should be deployed?
4. What can be done to promote energy efficiency?
5. Summary conclusion

Before delving into these questions, however, a brief summary of the existing situation is required to set the context for the discussion which follows.

## A. BACKGROUND AND SUMMARY OF SITUATION<sup>2</sup>

The District Heating Sector of Ukraine is, by almost universal consensus, in need of reform. In analyzing the sector and its problems, it is important to set the context to look at it from a multi-dimensional perspective. The dimensions include the supply side, the demand side, the regulatory side, and political side.

### 1. Supply Side

The country has as many as 7000 heat only boiler plants as well as 250 combined heat and power plants (CHP). Most of the plants use natural gas as their primary fuel. These plants are organized into some 900 companies, the overwhelming majority of which are owned by the municipalities in which they are doing business.<sup>3</sup> In 2008 the country had as many as 7712 utilities that operate 31312 heat only boiler plants. 67% of the plants use natural gas as their primary fuel.<sup>4</sup> The overwhelming majority of such companies are owned by the municipalities. 79 companies operate combined heat and power plants (CHP)<sup>5</sup>. A few of the plants are privately owned and operated. While specific figures vary, officials indicate that many of the plants are rather small, but several hundred are of significant size. Many, if not most, of the plants and pipe systems distributing the steam and hot water have suffered significantly from under-investment in improvements and maintenance, and are in varying states of sub-optimal condition. Plants are often inefficient and losses in the pipelines are

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<sup>1</sup> DH includes the provision of both heating and hot water on a communal basis across a pipe linked geographic area.

<sup>2</sup> This section is intended to be a summary only, setting the context for the analytical, regulatory focused, sections that follow. It is drawn largely from a review of previous reports on the sectors as well as upon a week of extensive meetings by the author in Kiev with key personnel in the sector in early December, 2009.

<sup>3</sup> Figures cited in "Regulation of Ukrainian District Heating Sector" a July 17, 2008 report prepared by Dr. Valdas Lukosevicius for USAID. A copy of this report is attached hereto as Appendix A, to add context to the analysis herein.

<sup>4</sup> Statistical bulletin –On Key Indicators of Work for Heating Boiler Plants and District Heating Networks of Ukraine for 2008”, State Committee of Statistics of Ukraine, 2009.

<sup>5</sup> The number represents a number of operators that obtained licenses for production of heat at combined electric and heating facilities. Official site of the National Energy Regulating Commission of Ukraine [http://www.nerc.gov.ua/control/uk/publish/article?showHidden=1&art\\_id=34112&cat\\_id=34111](http://www.nerc.gov.ua/control/uk/publish/article?showHidden=1&art_id=34112&cat_id=34111)

often significant. Many of the companies are not only unable to make needed improvements, but are also unable to pay for all of the natural gas they require to operate the boilers. They are also unable to control two of their main cost components, fuel and labor. They have no alternative to buying gas at regulated tariff levels. Wages are indexed to the national minimum wage law set by the Rada (Parliament), thus every time the minimum wage is raised, the salaries of all workers are adjusted proportionate to that parliamentary mandate. As will be noted below, recovery of those uncontrollable, and often rapidly rising costs, is not a simple matter. In short, the industry is hard pressed to serve its functions in a reliable and sustainable way.

## 2. Demand Side

On the demand side of the equation, heat is sold based on units of space being heated, not based on the amount of heat (or rarely steam) or hot water consumed. By the end of 2008, 11.4 million of apartments (59% of total number) were connected to the centralized heating systems and 8.1 million (42%) – to centralized hot water supply. 16.1 million (84%) are equipped with natural gas systems<sup>6</sup>. Only about 40% of buildings served have meters for heat and even fewer have them for hot water. There are very few, if any, customer-specific meters, thereby necessitating billing based upon space being heated rather than product being consumed. Compounding the problem is that when apartments were privatized in the 1990's, the legislation decreeing that was largely silent in regard to who bore the burden for the common areas of buildings such as entrances, hallways, exteriors and roofs. While some buildings have condominium associations assigning responsibilities for common spaces, the vast majority do not. As of October 1, 2009 the number of Condominium Associations in Ukraine was 9927<sup>7</sup>, which is around 13% of total number of residential buildings that have 5 floors and more<sup>8</sup>. As a result, even if individual apartment owners were conscientious in regard to their own efficient use of space heating, they have no control over consumption in such critical areas as entranceways, exterior walls, and roofs. Given the lack of meters and pricing that is determined by space served, rather than levels of consumption, of course, customers have little or no incentive to conserve or be efficient in their use of heat. Indeed, it could well be argued that with the lack of control over heat leakage through the common areas, customers have a powerful incentive to be inefficient in their use of energy, because they are compelled to consume more to overcome the heat loss in order to retain warmth in their homes. The issue is not confined to making building more efficient from a demand side perspective. Also relevant is the maintenance of heating and hot water pipes within buildings, the *MDI: responsibility for maintaining* which, in most cases is not clear<sup>9</sup>. Thus, leaking

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<sup>6</sup> Statistical bulletin –Housing Stock of Ukraine for 2008”, State Committee of Statistics of Ukraine, 2009.

<sup>7</sup> The State Committee of Statistics of Ukraine<sup>7</sup> beginning from January 1, 2006 publishes information on the number of registered CAs. This information is published as an indicator under section «Number of enteritis under single state registrar by sectors of economy and organizational and legal forms of activity»

<sup>8</sup> On January 1, 2009, the total number of residential buildings (including single houses) was 10,139,128, while the number of residential building that have five floors and more was 77,437 (Statistical bulletin –Housing Stock of Ukraine for 2008”, State Committee of Statistics of Ukraine, 2009).

<sup>9</sup> The issue of maintaining pipes within the buildings (operating repairs) and capital repairs is not a simple one in Ukrainian context. The legislation determines the owners of the individual apartments as co- owners of such pipes. Based on this, it is possible to conclude that they are responsible for the pipes' maintenance and capital

pipes inside buildings may well go unrepaired for lack of either responsible parties, or absence of economic incentives for building residents to repair.

The demand side picture is further complicated by factors related to housing and subsidy realities that actually tend to incentivize consumption over efficiency. At the time of privatization of apartments the buildings were occupied by residents who have subsequently moved into very different economic strata. Most buildings are now occupied by persons of widely varying economic circumstances. The result is that allocating costs to make buildings more efficient is quite complex since some residents are capable of meeting their obligations while others are not. Moreover, government subsidies to low income customers for heat are applied solely to consumption and not to conservation or efficiency. Making matters even more complicated is that there are several classes of people who, regardless of income levels, are eligible for privileges that relieve them of the obligation to make full payment of heating bills. These include war veterans, judges, and others who may not be financially needy, but whose receipt of subsidies for consumption removes any economic incentive for investing in, or even practicing, conservation or efficiency.

Finally, it merits mentioning that most buildings have been designed for district heating and therefore, lack ventilation, air ducts, and other essential infrastructure that would enable the installation of individual furnaces or hot water heaters to replace district heating or central piping that may be deteriorated. Thus, district heating and communal hot water supply must be seen as an ongoing requirement of most existing buildings that cannot be replaced without either significant cost, or high levels of exposure to health and safety risks.

### 3. Regulatory Side

While the Ministry of Housing and Municipal Economy of Ukraine has begun to play an increasing role in regulating DH by issuing licenses<sup>10</sup> and setting tariff criteria and processes,<sup>11</sup> regulatory responsibility, with the exception of CHP co-generation, lies primarily

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repair. However, as a rule, the owners are not managing the systems on their own, while this is carried out by the specialized entities (in many cases they are nominated by the local governments). Local governments also in many cases define centralized heating services providers, hot water service providers in multi stock buildings to be responsible for maintenance of building networks. According to the regulatory rules for tariffs setting, DH companies do not recover costs of maintaining and repairing the pipes within the buildings from DH tariffs. As a result, DH companies have no legal or financial resources for keeping the pipes in good condition. On the other hand, housing maintenance companies responsible for maintenance of the pipes, are not liable to the Dh companies for poor maintenance of the networks and leakages in the intra building systems. Finally, the law does not mandate the owners of the apartments to make regular contributions for capital repairs. So, in the buildings, where the Condominium Associations are not found, the owners do not pay for capital repairs of the building systems. Thus, there is a situation, when the law defined the owners of the apartments responsible for proper maintenance of their stock (including pipes within the building), while the owners do not realize what such responsibility is and ignore their duties.

<sup>10</sup> The licenses being issued are not on a vertically integrated basis. Rather, in anticipation of a more fully competitive sector, separate licenses are required for production, transport, and supply of heat.

<sup>11</sup> Tariff criteria (or Rules for tariff setting) are set by the Cabinet of Ministers. The rate making methodology is essentially a cost plus regime, but is, for reasons noted, administered in such a way that full costs are seldom recovered, especially those costs, such a fuel, which are subject to dramatic escalation.

with local governments.<sup>12</sup> Thus, with the exception of the few situations where the DH facilities are in the hands of private entities, municipal governments play two critical roles as both the owners and regulators of heating business. Indeed, it must also be acknowledged that they play a third, not unimportant, role, namely that of politicians accountable to the electorate for the quality and pricing of essential services. The three roles, as is readily apparent, are in fundamental conflict with one another.

The conflict between the municipality as owner and as regulator largely turns out to be whether the local officials decide to fully recover district heating costs through tariffs, the collection of which is strictly enforced, or whether to adopt less than fully compensatory tariffs and make up the difference from the municipal budget funds. Deciding which course to follow, more often than not, brings on the political calculation that higher tariffs are more likely to bring on the wrath of the voters than subsidies drawn from the local budget funds. There is an element of a moral hazard<sup>13</sup> here as well, because the subsidies, particularly in the case of not paying for all of the natural gas consumed by DH facilities, are often drawn not from the local budgetary funds for which municipal officials have responsibility, but from the coffers of the national government trying to make the gas provider whole. Stated succinctly, it is politically easier for local officials to keep district heating tariffs low and draw upon subsidies, many of which they themselves do not have to provide for, than to risk the wrath of angry district heating consumers.

The conflict is exacerbated by two circumstances that are ironic. One of the circumstances is an adherence to regulatory orthodoxy is passing on costs, and the other of which, ironically, is a failure to subscribe to a most basic regulatory principle. The bit of regulatory orthodoxy is that rates cannot be adjusted outside of the context of a full review of all costs. It is a commonly held theory of regulators, although not universally accepted, and certainly not without controversy, that adjusting tariffs for a single cost factor, or just a discrete set of cost components, distorts regulatory outcomes because while some costs may go up, other may actually be decreasing and tariffs should reflect all of those trends, not simply those that cut in one direction. The problem in Ukraine is that two sets of costs, fuel and labor, the former being the more important in the case of DH, have increased dramatically and the timing of those price changes do not fit neatly with the time period for conducting tariff reviews. Thus, significant costs are left unrecovered until such time as a full scale review of tariffs is carried out. That might be acceptable if there were provisions for a subsequent true-up with appropriate compensation for the time value of the lag in recovery, but such mechanisms are not offered. The result is inevitable losses for the DH companies. The failure to adhere to a fundamental precept of regulation is that the law does not require municipal officials to create

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<sup>12</sup> The National Electricity Regulation Commission (NERC), the national regulatory agency with jurisdiction over both electricity and natural gas in the country, has the power to allocate costs of CHP plants between electricity and heating customers, but possesses no other powers in regard to setting tariffs for heating customers.

<sup>13</sup> A moral hazard is a situation where a decision maker is empowered to make decisions for which he/she has no economic accountability. An example in might be where a local regulator may not permit tariffs to fully cover the cost of natural gas being used to fire the boiler because the regulator knew that the national government would cover the unpaid part of the bill for gas. Thus, the regulator could please local consumers while laying off the liability to pay on a third party for which the regulator had no responsibility.

independent regulatory agencies to oversee tariffs and other regulatory matters, but have instead assigned rate setting responsibility to executive bodies that are fully subordinate to the political entities at the municipal level. Thus, one encounters the specter of political officials often adhering to regulatory orthodoxy for purposes of suppressing tariff levels, while, at the same time, refusing to give up powers that might more appropriately be addressed by independent regulatory bodies. The result is that the vast majority of the DH companies are losing money, are unable to invest adequately in improvements, often need to defer maintenance, and are able to operate only because of subsidies of one form or another.

#### 4. Political Side

Some of the politics on DH are quite simple to understand. No politician wants to incur the wrath of consumers for raising DH tariffs to levels that many customers cannot afford. Similarly, the subsidies that go to certain classes of customers such as war veterans are from a political perspective, virtually untouchable. On the other hand, given the scale of the debt of the national government, as well as strong pressure from international lenders and donors, then government cannot continue to subsidize non-payment of gas by the DH companies, nor continue to subsidize all of the customers who are paying less than fully allocated costs for DH service.<sup>14</sup> The situation is dramatically illustrated by the fact that the Government itself is in a contradictory bind, where they do not want DH tariffs raised because that would require them to raise the amount of the subsidy they would have to pay for protected classes of customers, while, at the same time, they want tariffs raised so that the DH companies can collect sufficient revenues to enable them to pay for the gas they consume and not necessitate the government having to make the gas company whole. The result is a form of continuing paralysis that all recognize cannot continue, but for which no one seems to want to take full responsibility.

At the municipal level, the situation is somewhat the same. Most, if not all, municipal officials recognize that they cannot continue to suffer losses at the DH plants. On the other hand, they are not anxious to raise tariffs to the levels required to turn the red ink black. Many suggest that they would be willing to have independent regulation of the DH sector to provide relief from the constant demands of DH plants for subsidies from the municipal budget, but are very fearful of setting a precedent of ceding local authority to national officials. They often express that concern by suggesting that no national regulator can be as sensitive to local needs and concerns as the municipality. The result, much like at the national level, is a kind of paralysis that precludes action being taken to repair a situation almost everyone regards as unsustainable.

#### 5. Summary Conclusion

It seems clear that the current circumstances of the DH sector in Ukraine are unsustainable. The policy/political impasses at both the national and most local levels make it obvious that the current regulatory arrangements regarding the sector have not proven to be adequate in

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<sup>14</sup> Given the fact that the tariffs are almost always less than fully compensatory, it could well be argued that virtually all DH customers in the country are subsidized in one form or another.

addressing the needs of the DH sector and its economic viability. The sector, if it is to serve its purpose over the long run, is badly in need of regulatory reform that would allow it to be more efficient, economically self-sustaining, and serve the important purpose for which it was created. The balance of this paper is dedicated to discuss alternative paradigms to achieve that purpose.

## B. INDEPENDENT REGULATION

As noted, the current regulatory system is composed primarily of local political authorities making regulatory decisions. As noted, that system has largely ceased to function effectively. Thus, the first obvious stop on the road to reform is the creation of a system of professionally and technically competent regulation that functions in a way that frees decision-makers from the political dilemmas and impasses noted above. The creation of such a system will better enable decisions regarding tariffs and other politically sensitive matters to be made in a less politically charged environment and to be based more upon sound economic principles rather than short-term political considerations. In some senses it would be politically liberating for politicians to know that the hard decisions regarding the DH sector will be made by persons other than themselves, but that they are free to say what they please about those decisions without being held accountable for the political or economic consequences.

It should be noted that independent regulation should not become insensitive regulation. Making hard regulatory decisions does not require regulators to be insensitive to the realities of investors and consumers alike. The regulatory system needs to take care to address public concerns, provide for meaningful public input and participation into its processes, and respond carefully to concerns raised by consumers, investors, and politician alike. Listening to and hearing those concerns, and even addressing them, however, do not require regulators to suspend their own judgment, they must simply give them appropriate weight and consideration before decisions are taken.

Given the circumstances of the DH sector in Ukraine today, as summarily described above, there is no real alternative to the creation of an independent regulator for the sector empowered to exercise full oversight. That oversight should include, but not be necessarily limited to, writing the terms and conditions of licenses, deciding rate design questions, setting tariffs and/or approving contracts between regulated companies and their customers, promoting and maintaining competition where possible while controlling monopoly power where competition is not possible, handling customer complaints, setting and enforcing quality of service rules, and carrying out such other responsibilities as may be required for the regulator to fulfill its mission.

## C. CENTRALIZED VS. DECENTRALIZED REGULATION

Once it is determined to create a system of independent regulation for the sector, the next question is whether that system should be centralized at the national level, decentralized to the municipal or other level, or come combination thereof. It is useful to consider the pros and

cons of such approaches, first on a theoretical level, and then in the specific context of the DH sector in Ukraine.

The theoretical benefits of decentralized regulation (municipal, or, perhaps, oblast) are greater sensitivity to local concerns<sup>15</sup>, easier accessibility for consumers, and allowing for greater experimentation and diversity than a single national regulatory system might enable. It could also be argued that since the DH industry is, itself, not centralized, local regulation is more symmetrical with the industry structure than would be centralized regulation. The downside of decentralization is the danger of regulatory capture,<sup>16</sup> less insulation from short-term political considerations, and the difficulties in attracting and retaining the professionally and technically competent personnel required to carry out regulatory activities in each of the jurisdictions establishing regulatory agencies. Local regulation is also likely to be more expensive, and less likely to function at the desired level of professional and technical skill because of the expense required to replicate resources and personnel in each jurisdiction. Jurisdiction by jurisdiction regulation is also likely to discourage potential private investment in the sector by adding additional uncertainty and complexity to the calculations that investors need to make before putting their capital at risk in the DH sector.<sup>17</sup> Local regulators of the DH sector may also not be in the optimal position to try to influence national policy makers on such relevant questions as subsidy design, energy policy, and housing policy. Finally, in small jurisdictions, it is not at all clear that there is sufficient workload to justify the creation and maintenance of a fully functional regulatory agency.

The theoretical benefits of centralized regulation are that it would be further removed and insulated from short-term political considerations,<sup>18</sup> it would enable the achievement of economies of scale and scope by not having to replicate regulatory resources jurisdiction by jurisdiction, the recruitment and maintenance of highly skilled and competent personnel would be easier at the national level, would be less subject to risk of regulatory capture, and by unifying and simplifying regulation, would make DH more attractive to private investors.

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<sup>15</sup> The concept of sensitivity to local concerns can have many connotations. At one level they suggest such considerations as community planning, local environmental effects, appreciation for the local economy, and perhaps resource preferences. They also may simply refer to a respect for local autonomy from central control. On an entirely different level, it could simply mean a local desire to keep tariffs low.

<sup>16</sup> Regulatory capture is the concept that regulators come to think and act as if they are the same as particular interest groups. It is often found where the regulatory system exists in something of a vacuum where only a few players interact, and, over time, begin to think and act alike. Where capture occurs, regulators stop exercising fully independent judgment and tend to make decisions that reflect the thinking of those by whom they have been captured.

<sup>17</sup> Private investors in regulated industries, particularly, but not only, foreign ones, take a positive view of a number of regulatory characteristics, such as predictability, fairness and reasonableness, respect for contracts, relative simplicity, comprehensiveness, understandability, professionalism and technical competence, and independence. While multiple local regulatory agencies may each meet those criteria, the fractured nature of multiple local jurisdictions will make investors a bit wary. That is particularly the case, where there are economies of scale in acquiring and operating multiple DH companies, but where the regulation of each is unique.

<sup>18</sup> In regard to sensitivities to local concerns, it is worth pointing out that this is a double edged issue because while some level of awareness of local concerns has value, too much deference to them can be quite counter-productive when hard decisions regarding economic realities have to be taken.

Central regulation would better enable regulators to transfer lessons readily from one company to another. The agency would be able to learn lessons on what has worked well and what has not and to apply those lessons more broadly than a single jurisdiction regulator might be able to do. It would also interface better with the national government on such critical policy issues that bear upon the DH sector as housing policy, subsidy design, and energy policy. Conversely, of course, national regulation would be further removed from local considerations, would be asymmetrical with the decentralized, non-interconnected structure of the industry, and may not be as tolerant of local experimentation and diversity as multiple local regulators might be. Finally, there is the issue of the sheer size of the regulatory burden. With so many companies to regulate, it is reasonable to ask whether any single agency is capable of managing the regulation of so many companies. Thus, as in the case of local regulation, there are pros and cons to centralizing DH regulation.

When one overlays the reality of the Ukrainian DH sector onto the theoretical arguments, it seems apparent that the advantages of centralized regulation outweigh those in favor of local regulation. It is readily apparent that the current system of regulation, predominantly decentralized, is simply not functional in the sense that the outcome is a financially viable, sustainable, industry. The fact that the current system is of a political, rather than independent regulation, model, does not, *per se*, preclude the advisability of decentralized regulation. It does, however, suggest that the political currents at the local level are powerfully aligned against making the hard decisions that will assure the long-term financial viability of DH enterprises. It is not clear that local regulatory agencies, particularly embryonic ones lacking deep institutional roots, will be any better positioned than local political leaders to withstand public pressure to artificially suppress DH tariffs. The problem is compounded when viewed in the context of greater probability of capture and the difficulty of recruiting the high level of professional personnel into multiple local agencies that are required to effectively fulfill the regulatory responsibility. It is also questionable whether it is more important for DH regulators to be closer to local concerns or to be able to interface effectively with national policy makers in such closely related subjects as energy and housing. On balance, it seems apparent that the latter is more important than the former. While there is value to the experimentation that local regulation might enable, it would seem more important at this stage of evolution of the regulatory regime for DH that a strong regimen is of more value than is encouraging more diversity in the current context of political regulation at the local level. Thus, the theoretical advantages that local regulation might bring are largely outweighed by the enumerated advantages that might be derived from centralized regulation. As noted, those include assembling and maintaining the resources and expertise to do the job, capturing the economies of scale and scope in regulation, as opposed to have to replicate resources at considerable cost, developing an environment that more private investors might find attractive,<sup>19</sup> and greater distance from political considerations.

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<sup>19</sup> There is a powerful argument, although it is beyond the scope of this paper to fully address and analyze, that the DH industry is one that cries out for corporate consolidation that would allow effective management of a fleet of DH facilities, rather than less efficient plant by plant management. Central regulation would be a more effective enabler of desirable corporate consolidation than might multiple local regulators.

While it seems apparent that centralizing DH regulation is advisable, there are, perhaps, some special considerations that should be made. One is the sheer size of the work burden. While there are other regulatory agencies with very heavy burdens that are capable of managing them, it will be important to give any newly created agency some degree of flexibility to manage the burden: by allowing it to employ consultants; by perhaps delegating certain functions to local agencies<sup>20</sup>; by setting realistic deadlines for the fulfillment of the agency's early tasks,<sup>21</sup>; and by allowing the agency to impose systematic reporting requirements on the regulated companies that facilitate the agency being able to handle and digest large volumes of data. Additionally, it might be politically and substantively useful to provide local governments inputs into the selection of regulatory personnel. If, for example, there were to be five Commissioners at the head of the agency, one might be appointed at the suggestion of the Ukrainian Association of Cities and Communities. The key point is that the benefits of centralization of regulatory authority can be achieved without a total loss of some of the better aspects of localized regulation. Those are details to be considered, but the critical point is that centralized regulation, even with its flaws, offers substantially greater benefits than does a regime of municipal, or even regional (e.g. oblast) regulation.<sup>22</sup> It is the preferred option.

#### D. REGULATORY INSTITUTIONS AND ARRANGEMENTS

The next question, once it is decided to centralize the DH regulatory function, is whether to set up a new agency, or add the responsibility of DH regulation to the portfolio of an existing agency. In looking at the state of infrastructure regulation in Ukraine, the only logical existing agency to which oversight responsibility for DH might reasonable be assigned is the National Energy Regulatory Commission (NERC), which is the current regulator of electricity and natural gas markets.

There are benefits to consolidating regulation of DH into the existing agency. In fact, there is Ukrainian precedent for doing so, as NERC was originally created to regulate the power sector in the early 1990's, but several years later was given the powers to regulate the natural gas market as well. The benefit of consolidating is to access the existing expertise in regulatory economics, accounting, and other relevant infrastructure-related fields, to share administrative and other overhead costs, to coordinate policy in such overlapping areas of

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<sup>20</sup> The initial handling of consumer complaints is a function that it might be advisable to delegate to local bodies, both because it spread the work burden, but also because it makes the agency more accessible to consumers, and provides input to the agency about specific local problems, of which it might otherwise not be aware.

<sup>21</sup> A good example of this would be to provide some flexibility in the timing of original tariff and rate reviews of each company by the new regulatory body. While every rate review can have its complexities, matters tend to become a little more systematic after the handling of the initial cases provides guidepost for subsequent proceedings.

<sup>22</sup> The discussion of oblast by oblast regulation, as a middle ground between municipal and central regulation is largely omitted from this paper. The reason for this is that oblast regulation, while perhaps something of an improvement over municipal regulation, in the sense that it is a bit more consolidated, would, nonetheless, carry many of the same detriments as local regulation and fewer of the benefits of centralized regulation. Any further discussion of it as possibility, therefore, would largely be redundant to the discussion already set forth on centralized versus decentralized regulation.

interest as competition policy, co-generation, and natural gas, and to have the benefit of multi-sector exposure as a hedge against regulatory capture. Consolidation will also likely reduce the overall costs and delays typically associated with launching a new regulatory agency.

Despite the benefits of adding DH to NERC's portfolio, there are reasons for setting up a separate agency at the national level dedicated to regulation of DH. In that regard it is important to note that NERC itself does not want the responsibilities. The reasons given for not wanting it included the scope of work involved, particularly the number of new companies that would come within the agency's jurisdiction, the enormous political issues, particularly local ones with which NERC is not accustomed to dealing, and the fact that NERC believes that experience in Eastern Europe suggests that for countries the size of Ukraine, multi-sector regulatory agencies are not appropriate. Agency officials also suggested that there were aspects of the DH sector which would require a level of expertise they did not currently possess. That being said, NERC officials also indicated that if the Government decided to give then the responsibility for DH regulation, they would take on the task.

Beyond NERC's lack of enthusiasm for the job, however, there are at least three other quite serious reasons for not assigning NERC regulatory oversight powers for DH. The first is that NERC's experience with retail tariffs in gas and electricity gives great pause to any serious advocacy of the agency to be the regulator of DH. NERC lacks the legal power to give final approval to many retail tariffs in the markets it currently regulates. Electric and natural gas tariffs have to ultimately be approved by the Ministries of Finance and of the Economy, and are subject to veto by the trade unions. Pursuant to the CoM D #1548 December 25, 1996 (with the amendments), NERC has responsibility for setting retail tariffs for natural gas and electric energy for all customers, but lacks final say in regard to some of the biggest users, as illustrated in the two bullets points below:

Specifically:

- The Ministries of Economy and of Finance approve price limits for natural gas for entities, which produce heat energy, including block type (module) boiler houses, which are installed at roofs and adjacent to the buildings (based on the volume of gas which is used for production and provision of heating and hot water supply services to the resident and under condition that such entities have separate metering of heat and hot water and accounting system).
- The Ministry of Economy also approves the price limits for natural gas for organizations and institutions that are financed from the state and local budgets, as well as price limits for natural gas for industrial users and other entities;

Replicating that very notable lack of regulatory authority and independence for DH would do little to solve the financial difficulties of the DH sector. Indeed, it could very likely take the identical problems that currently play out at a municipal level into national issues. It is difficult to see how DH regulatory powers could be assigned to NERC without revisiting the entire issue of NERC's retail ratemaking powers in general, an issue which could enormously complicate the task of establishing DH regulation on a sound footing. Moreover, given NERC's lack of enthusiasm for taking on the job of regulating DH and given the severity of

the problems NERC already has in its current regulatory domain, it is not at all clear that NERC would, or could, devote to DH the level of resources required to turn the sector around.

The second reason why it might not be advisable for NERC to be assigned regulatory responsibility for DH is that it lacks the requisite expertise in housing policy that is inherently required of a DH regulator. As was noted above and will be noted in the discussion of energy efficiency below, DH regulation will require a significant awareness of, and expertise in, housing policy, building codes, and community planning. That is part of what NERC officials were referring to when they discussed what they may currently be lacking in expertise when they contemplate the suggestion that they take over responsibility for DH regulation. DH regulation is of sufficient complexity that it may well require the effort of an agency that can dedicate all of its efforts and resources to that sector alone.

Finally, there is the significant fact that NERC has never been established by law. It was created by Presidential Decree only. As a creature of decree, not law, its powers, indeed its very existence, can be altered by decree. That means it requires only the decision of a single political figure, rather than the entire Rada, to fundamentally alter the regulatory landscape. By definition, therefore, NERC exists on a less permanent, less legally rooted, foundation than would be advisable for a regulatory agency having to make politically and intellectually difficult, indeed, controversial decisions. While there have been efforts underway to pass a law making NERC a creature of law rather than decree, those efforts have yet to come to fruition. Adding the DH responsibility to NERC's portfolio, when the agency's authority rests solely on a Decree and not on the law is less than desirable. It is important that regulatory responsibility over DH be rooted in law because the regulators will have to make difficult decisions, and that task will be much more difficult, indeed, much less independent if the agency is also subject to the whims of a single political figure.

On balance, while there are reasonable arguments for consolidating DH regulation with electricity and gas regulation, for the reasons noted, it is preferable not to do so and to establish a new agency solely dedicated to the regulation of DH. MDI: *what about water and wastewater, as it is discussed now?* That being said, however, it is useful to contemplate mechanisms by which the new agency can fully coordinate with NERC on areas of common and intersecting interests, such as co-generation and natural gas. Co-generation in particular merits attention because while NERC currently has responsibility for allocating costs between electricity and heat production, it would be useful to have the balanced views of regulators responsible for both heat and electricity production.

#### E. PRICING: METHODOLOGY AND POLICY

In thinking about establishing a new regulatory framework for DH, it is absolutely critical to think about the appropriate methodology for setting rates and tariffs. For customers and investors in markets with monopoly constraints,<sup>23</sup> it is the methodologies employed by

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<sup>23</sup> It is important to note that DH is explicitly deemed a "natural monopoly" under Ukrainian law. While DH may, in most cases in Ukraine, be a *de facto* monopoly, in economic theory it is not a "natural monopoly," because there are alternative methods of procuring heat and hot water, such as individual furnaces and hot water

regulators that establish the prices for customer as well as the revenue streams for companies. The ratemaking methodology also sends price signals to investors (public and private) about how much capital to put to work, while, at the same time sending signals to consumers about consumption and use of energy. Pricing is absolutely central to the effectiveness of any regulatory regime.

In pricing for DH, as in the case of electricity and natural gas, there are three basic methodologies that can be used: rate of return, price cap, and revenue cap. There are some commonalities to each methodology that should be noted. They all depend on clear accounting rules that define how revenues and expenses should be categorized. They are all premised on some notion of costs, although how those costs are actually determined may vary. All of them also establish an overall revenue requirement that the company needs to conduct its business in a sustainable fashion and then allocates the responsibility to pay to customers proportionate to what it costs to serve them.<sup>24</sup> The tariffs actually formulated can take a variety of different formulations.<sup>25</sup> Each methodology determines what a company's overall revenue requirements are and then endeavors to establish tariffs that provide the company with a reasonable opportunity, assuming prudent and efficient performance.<sup>26</sup> In addition, tariffs under all three methodologies often contain a variety of taxes and cross subsidies that are, in effect, "hidden taxes." All of the methodologies require some degree of periodic regulatory review, the initiation of which can be automatic (i.e. by terms of law or license, by the company, by customer complaint, or by the regulators themselves.

Preliminarily, it is very important to note that not all costs are necessarily to be recovered through the basic rate methodology. Some costs, particularly ones beyond a company's ability to control, such as fuel costs, are recovered through adjustment clauses that permit those costs to be flowed through directly to customers. Such adjustment mechanisms are periodically (e.g. quarterly) adjusted up or down to track the actual process paid. The benefits of such clauses are that they reduce the lag time for recovery of rapidly escalating costs, and they reduce the refund time for returning decreasing costs to consumers. As noted above, the regulatory lag in the Ukrainian DH sector for recovery of fuel and labor costs has been a recurrent problem. Those costs might be excellent candidates for inclusion in an adjustment clause of some sort, independent of the basic ratemaking methodology. Such clauses are fairly common under any of the three methodologies discussed below. Finally, in regard to

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heaters. In any event, that theoretical argument does not change the existing law. While perhaps some change should be contemplated in the Natural Monopoly law to reflect the distinction between a monopoly in fact and a "natural monopoly," it must be fully recognized that there are serious barriers to the deployment of alternatives to DH. Those barriers include the design of existing buildings and health and safety considerations.

<sup>24</sup> Costs are theoretically assigned to customers by the actual costs incurred to serve them. Because that is extraordinarily difficult to do on a customer specific basis, it is customarily done on the basis of customer class, typically including, at a minimum, residential, commercial, and industrial classes.

<sup>25</sup> Tariffs, for example, often have two parts: one to reflect fixed costs, such as capital investment and back office equipment, and the other reflecting variable costs such as fuel. There are also frequently special purpose tariffs, often used, for example, to serve the need of low income customers

<sup>26</sup> It is important to note that none of these methodologies guarantee that a company will meet its revenue requirement. The methodologies, when properly administered, should strike the appropriate balance between not erecting arbitrary barriers to regulated companies being able to achieve their revenue requirements and providing appropriate incentives for management to perform competently and efficiently.

fuel prices specifically, allowing price increases to flow through directly to consumers sends a very important price signal in regard to consumption patterns and end use efficiency.

Rate of return regulation (ROR) is probably the methodology that has been in longest use. It is still the predominant form of infrastructure regulation in the U.S. Its basic formulation is:  $(\text{Capital Investment} - \text{Depreciation}) * \text{ROR} + \text{Expenses}$ . Regulated companies recover their capital investment in the form of annualized depreciation payments over the anticipated life of the capital asset. Each year they are also allowed to recover an authorized rate of return for the remaining asset base (i.e. that portion yet to be depreciated). In addition, companies are authorized to recover their operating expenses. It is important to note that operating costs are recovered on a cost basis only; there is no profit margin permitted on operating costs. There are two important caveats on what costs, capital and operating, companies can recover from their customers. The only costs which are recoverable are those which were prudently incurred,<sup>27</sup> and those costs whose recovery is not precluded by law.<sup>28</sup> The rate of return that is established by the regulators is based on the cost of debt plus an allowed return on equity based on a variety of factors including company performance and investor expectations. Typically, regulators will require companies to have a capital structure that is appropriately balanced between debt and equity.<sup>29</sup> All of these determinations are made in the course of rate cases, which are in fact intensive examinations of the companies' finances and performance.

Price caps (PC) developed as an alternative to rate of return. Critics of the latter argued that rate of return regulation provides incentives to utilities to over-invest in capital assets since the return on capital assets, and not productivity gains, offer the only opportunity to earn a profit,<sup>30</sup> and that ROR rewarded poor performing companies by pegging ROR to investor expectations.<sup>31</sup> Another criticism of ROR that PC was designed to alleviate, is that the transaction costs, in terms of rate cases, are quite heavy and the regulatory burden should be

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<sup>27</sup> Prudence is usually defined as being decisions consistent with good industry practice and sound business judgment based on what the company could or should have known at the time decisions were taken. Typical prudence disallowances might include cost overruns caused by poor management, supplies procured at above market prices because of inappropriate purchasing practices, or acquisition or retention of assets not needed to serve the company's customers. Utilities often describe prudence reviews as "second guessing" or "micro-management" by regulators. Regulators, quite naturally, view prudence reviews as an important element of consumer protection.

<sup>28</sup> Typical of costs whose recovery is precluded by law in the U.S. are lobbying and political expenditures, charitable contributions, and costs incurred which are not necessary to serve customers.

<sup>29</sup> The debt equity ratio required is usually in a range of 60/40 to 40/60, and is premised on trying to establish the proper balance between the cost of attracting capital, the appropriate exposure to risk, and providing incentives for good management. In the case of state or municipally owned companies, the capital structure is of less consequence.

<sup>30</sup> This criticism is accurate in a technical sense. In practice, however, because of the timing of rate cases, productivity gains sometimes go directly to the company's bottom line, as well.

<sup>31</sup> This criticism is correct, to the extent that regulators set higher ROR's for less well-managed companies in order to entice investment in companies whose management was viewed in a lesser light by investors. Conversely, lower returns were required of well run companies because investors had more confidence in the company. The flaw in the criticism is that poorly run companies were more likely to have a reduced asset base on which to earn a return, and to have costs that cannot be recovered. because of a higher probability of prudence disallowances

reduced.<sup>32</sup> The formula for PC is: Cost Basis adjusted by (RPI-X). The cost basis may be the actual costs, in which case the PC depends on periodic rate cases (whenever must be reviewed), or it may be a benchmark or hypothetical set of costs.<sup>33</sup> The costs are then used to formulate tariffs that go into effect for a period of years.<sup>34</sup> The rates are frozen for the stated period, subject only to annual adjustments to reflect inflation or some other index (RPI). In most cases, the RPI is adjusted by the X factor, an expected increase in productivity. The X factor is meant to divide productivity gains between the investors and customers. Every year a certain amount of productivity gain is assumed and returned to customers. If the company fails to achieve those gains, then it loses that portion of the RPI adjustment, but, if it attains productivity gains in excess of the X factor, it keeps the money.<sup>35</sup> Whereas ROR, which analyzes all costs, and to the extent that they are deemed prudent, allows them to be recovered, PC internalizes all costs into the formula and makes no adjustments to reflect variations in different cost components. The only exception to that practice is when by explicit arrangement, some costs, the control of which are beyond the control of the company, are allowed to be recovered through a separate adjustment mechanism, as discussed above. PC is the most commonly used tariff methodology around the world because it works well where it is difficult to ascertain precise cost levels, and because many investors believe it to be less subject to regulatory or political "tampering." Its subjectivity, however, necessitates the regulators being correct about both costs and productivity at the outset, and relative inflexibility.<sup>36</sup> Another risk associated with PC methodology is that regulators will assume that more is internalized into the tariffs than actually is. A classic example of that is when the regulator fails to distinguish between incentives for cost cutting and for productivity gains. The former are easily achieved by cutting workers, maintenance, and other expenses. Doing so may not, however, assure any productivity at all, but may lead to a diminution of the quality of service in the long run. Thus, regulators must closely monitor the quality of service rendered and not simply assume that cost cutting, in and of itself, is beneficial.

The final methodology is also the one least utilized,<sup>37</sup> but it is beginning to gain some traction because of environmental and energy efficiency concerns. It is revenue cap regulation (RC). It resembles price cap except that, rather than capping the price per unit of consumption, it caps the overall revenue a company may collect. In both ROR and PC regulation, the more energy a company sells, the more money it makes. The result is that companies have no incentive to assist their customers to consume steam or hot water more efficiently. In fact, the more customers conserve or are more efficient their usage, the fewer sales and profits the

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<sup>32</sup> ROR does, indeed, have significant regulatory costs, but it is not always clear that PC reduces them, or, if it does so, at what cost in terms of the flow of needed information.

<sup>33</sup> Benchmark or hypothetical costs are usually based on some notion of a model distribution company cost structure. They are often used where it is impossible to ascertain the actual costs, usually because of inadequacies in accounting records, or where they are part of an incentive scheme to improve productivity. Choosing what benchmarks or hypothetical costs to employ is a complicated and usually controversial matter.

<sup>34</sup> Five years is typical, but there are examples of shorter and longer periods of time being used.

<sup>35</sup> X factors are sometimes not adopted in order to "sweeten" incentives for investors.

<sup>36</sup> The problem is that if the regulator has miscalculated the costs or the potential for productivity gains, the result could be excessive profits for the companies, or, at the other end of the spectrum, the imposition of unsustainable losses. Both such outcomes, of course, are unacceptable.

<sup>37</sup> At present, it is being utilized in electricity in Norway and in some U.S. states, most notably California.

regulated companies make. Thus, while end use efficiency and conservation are in the public interest for both environmental and overall efficiency reasons,<sup>38</sup> the incentives for regulated companies in water and energy are designed to discourage companies from helping customers to conserve. RC regulation is designed to align the interest of the regulated companies with the public interest in end use efficiency. By capping revenues and not prices per unit of consumption, regulated companies become financially indifferent to their overall sales volume and can find it just as profitable to promote conservation and efficiency as it is to sell energy or water.<sup>39</sup> The focus is on what the customer uses steam or hot water for, as opposed to buying the commodities themselves.<sup>40</sup> To the extent that a company's sales are reduced and revenue requirements are not met, the company's rates are adjusted to permit them to attain the revenue needs. The potential problem with RC is that it is not always easy to ascertain if the revenue requirements were not attained because of company efforts to promote end use efficiency gains, or because of other exogenous factors. As a result, critics of RC argue that many costs are being socialized, even those that ought not to be socialized, such as weak management performance, economic downturns, or abnormal weather patterns.

The question of which methodology is optimal for deployment for DH in Ukraine is a question that must be a critical component of establishing a new regulatory regime for DH. In fact, the basic methodology to be used in setting tariffs should be included in the law in order to assure some degree of predictability and certainty in setting prices and establishing streams of revenue. Each methodology has real benefits for Ukraine, but each has significant drawbacks as well.

Rate of return regulation, for example, would be useful because it would compel a very rigorous examination the costs and cost structure of each DH company. It would be the approach most likely to produce hard data on how money is being spent and making transparent the actual costs of doing business. The rigor required by ROR regulation provides an excellent disciplinary framework for carrying out effective price regulation. Rate of return is also likely to produce a powerful incentive for needed investment in plant and equipment, although, as long as the companies are not privately owned, it is not clear how meaningful such incentives would be. On the other hand, it is not clear that the accounting in the past has been sufficiently accurate to allow for a fully meaningful, or even reasonably precise, scrutiny of costs. Finally, because of its rigor and labor intensity, ROR may be the most difficult methodology to deploy in the context of a new agency having such a heavy work burden. Over time managing that burden may become easier, but in its initial stages, a great deal of effort would have to go into the establishment of meaningful ROR.

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<sup>38</sup> In the case of imported fuels, of course, energy efficiency and conservation also have a national security value.

<sup>39</sup> In California, in fact, the regulations in place may make it more profitable to get customers to conserve and to be more efficient in their use of energy than they would be if they simply encouraged customer to consume more.

<sup>40</sup> An example is that customers do not want to buy steam as a commodity, but want to enjoy what steam can provide, namely heat. If customer can receive the same household temperature with less steam because he/she insulates his/her apartment, he/she is just as content, and perhaps more so, because they are saving money.

Price caps tend to be a little less rigorous (although in theory they need not be so) and offer investors the perception of more certainty over time. As noted, however, that certainty is fully dependent on how well the regulator understands the costs and opportunity for productivity gains. If the regulator is unable to fully gauge the situation, that certainty may be more apparent than real, and if the calculations are inaccurate, they could lead to more instability than anticipated. Indeed, because of potential gaps in the accounting, there is a high probability that regulators will not be able to fully and accurately make the calculation necessary to make price caps work effectively. On the other hand, because price caps can use proxies for actual costs and because overall scrutiny of costs is less, the workload on the regulators can be less demanding than for ROR, but that reduction can be costly in terms of setting appropriate incentives and price signals. In addition, price caps may well require more scrutiny in areas such as service quality and safety because price caps provide strong incentives for cutting costs, incentives which can produce more productivity, but absent regulatory scrutiny, can also produce lower service quality and jeopardize health and safety.

Revenue caps promote efficiency and conservation, but involve a level of regulatory uncertainty in terms of how adjustments are made that make many investors and consumers a bit skeptical. In DH in Ukraine where much heat is lost because of lack of appropriate building standards, lack of insulation and weatherization, and lack of effective price signals to customers, giving DH companies an incentive to promote more end use efficiency makes perfect sense from a policy point of view. Similarly, if Ukrainian households can enjoy comfortable temperatures in their homes while using less energy, the country is being well served. Providing DH companies with incentives to help customer be more efficient and less wasteful would be a step in the direction of creating a more energy efficient society. The problem in administering revenue caps effectively is not a small one. As in the case of ROR, the regulator needs to have a good understanding of what costs are, of which reductions in heat sales were due to company efforts to reduce demand and merit a revision in the company's tariffs to reward the company for its efforts, and which were the result of factors irrelevant to a company's energy efficiency programs and are not deserving of tariff revisions. The absence of customer-specific meters makes the task that much more difficult. Thus, while revenue caps would seem to offer the best incentives from the standpoint of public policy, they may offer the most formidable challenge from the standpoint of actually being administered.

As noted, each of the pricing methodologies has its benefits and potential pitfalls for Ukraine. Ultimately, given the country's dependence on imported gas, and given the potential for achieving gains in end use efficiency, revenue caps may make the most sense, but it is not clear that the tools required for implementing it, such as customer meters and fully transparent cost accounting, are sufficient at present to do so. Similarly, ROR regulation would be a marvelous tool for regulators to gain the full and transparent knowledge of costs they should have, but it seems apparent the workload to carry out such an effort at each of the multitude of DH companies would be a most imposing burden, perhaps not fully sustainable in the short term, although perhaps possible over time. That leaves price cap regulation, which seems to be less labor intensive and less data dependent. The problem with taking advantage of those two facts is that PC, because of its fixed time frames for rates to be in effect, is less flexible in

terms of adjusting after initial rates are established. Thus the errors associated with lax accounting and less comprehensive knowledge of costs may cause more problems than they solve.

The result is that it is premature, as of the time of writing this paper, to recommend a specific methodology to be written into law. Rather, in the short term, it is strongly recommended that this issue be more fully explored in order to be able to write the methodology into the law. The steps taken would be to more fully explore the accuracy of existing accounting, the policy going forward on the installation of meters, and other such relevant question.

#### F. ENERGY EFFICIENCY

For all of the reasons noted above, DH companies ought to be incentivized to promote more efficient heating. From the standpoint of competition policy, it makes sense to declare that the DH company should confine its service to beyond the walls of the premises of customers. Certainly services that increase end use efficiency, such as insulation and weatherization, or even the maintenance of inside plumbing, are activities to which there are few barriers to entry and are fully contestable business opportunities. The problem, however, is that the price and other signals sent to end users of DH services are virtually useless for purposes of promoting the efficient use of energy. First, individual meters are virtually non-existent, and because of both cost and technical consideration are likely to remain so in existing buildings for the foreseeable future.<sup>41</sup> Second, because of the absence of meters, customers are not billed based on consumption, but, rather, based upon square meters being heated, a practice that provides a powerful incentive to ignore efficiency. Third, as referenced above, there is the major problem that in most residential buildings no one has responsibility for such critical parts of the buildings as entrances, exterior walls, roofs, and hallways. The same is also true of interior pipes that carry steam and hot water. One can only imagine the amount of heat that is lost and energy wasted because of that. Thus, even though there are no legal barriers to preclude entrepreneurs from offering their services, there are also no incentives for customers to retain them, or, in the case of common areas, no customers at all. Thus, competition theory is rendered largely irrelevant. Thus, it makes sense to encourage DH companies to engage in energy efficiency projects. While, as noted, revenue caps would provide them with incentives to do so, even if it is determined that they are not practicable, DH companies should be provided with incentives (e.g. full, perhaps accelerated, cost recovery and/or profit opportunities) to engage in cost effective demand-side management. If, over time, the price signals, the metering, and the common area problems get sorted out, the DH companies can be required to pull back from their demand side activities and facilitate the entry of new entrants.<sup>42</sup>

The simple fact is that given Ukraine's vulnerability to the price of fuel imports, the amount of energy wasted by inefficient district heating is simply not acceptable as a matter of public

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<sup>41</sup> Certainly, for new buildings, steam and hot water metering, as well as weatherization criteria ought to be required by code.

<sup>42</sup> In fact, if it was decided to promote new entry into the demand side activities early on, the DH companies could be required to conduct competitive solicitation of demand side services from outside contractors.

policy, and the new regulatory agency should be charged with not only improving the quality of supply side services, improving pricing, and protecting customers against arbitrarily high prices and low quality service, but also with promoting end use efficiency. The agency should have included in its legal tools means for dealing with inefficient use of energy. One example would be to provide the regulatory agency with the power mandate the insulation of the common areas of buildings and allocate the costs among building residents over a sufficient length of time so as to make the rate impact of such a step less burdensome on customers.<sup>43</sup>

It seems readily apparent that public policy would be well served if regulators were given the mandate to treat cost-effective demand side management activities in much the same way that they treat supply side activities. It should be seen as an integral and vital part of regulatory reform in the DH sector.

That being said it should be noted that the installation of individual meters, would enable the sending of appropriate price signals to end users. Providing that signal would reduce the lack of consumer information that is a basic cause of the market failure found in the DH sector. The problem is that installation of individual meters is not only an expensive undertaking, in and of itself, but also, because of the design of the pipes system within buildings, it is not clear that a single customer could respond to price signals without affecting his/her neighbors. This is because many buildings have a single continuous pipe and afford no customer the ability to exit the system or alter usage without affecting the supply to others downstream. Thus, the recommendation that DH providers be required to engage in conservation and efficiency, is premised on the notion that individual meters are not likely to be installed on a mass basis any time in the near future. There is, of course, considerable discussion of installing meters at the point where the hot water enters a building. That would provide the building as a whole with price signals, but it is not entirely clear what the residents of the building will or can do with that information, especially where there is no system for building governance, such as a Condominium Association. Absent successful resolution of the metering problems, allowing DH companies to engage in demand side activities and providing them with incentives for doing so, makes eminent sense.

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<sup>43</sup> Toward that end, the Government would be well advised to reconsider its subsidy programs for heating, so that it does not solely subsidize consumption. It would be more cost effective in the long run to provide subsidies for measure that would reduce consumption and actually reduce the amount of governmental outlays to subsidize consumption.

## Appendix A



# REGULATION OF UKRAINIAN DISTRICT HEATING SECTOR

Prepared by: Dr. Valdas Lukosevicius

**July 17, 2008**

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# REGULATION OF UKRAINIAN DISTRICT HEATING SECTOR

Dr. VALDAS LUKOSEVICIUS

July 17, 2008

A Report Prepared for USAID

## *1. Current situation in Regulation of Ukrainian District Heating (DH) Sector.*

The situation in the District Heating Sector of Ukraine became worse when large DH enterprises were reorganized into the smaller companies (more than 900), ownership was transferred to the municipalities and real regulation was moved to local administrations. As a result of these changes technical and management capabilities were lost, "political" regulation took over economical logic in many cases, the shortage of financial resources caused unreliable and inefficient operation, and very slow processes of renovation resulted. Uncontrolled disconnections, consumer debts, incorrect regulation (for instance, smaller consumer, lower gas price) and significantly increasing prices for fuels and other resources make situation in DH sector of Ukraine critical. There are cases when DH networks were frozen during winter time and people evacuated from multi-flat buildings, some DH systems collapsed and were shutdown at all.

Heat production is carried out by 250 cogeneration (CHP) plants and more than 7000 heat only boiler plants. Cost allocation between heat and electricity in CHP plants is controlled by National Commission for Regulation of Ukrainian Electricity Sector (NC). This institution has prepared three different methodologies for cost allocation but all of them are not officially approved by state institutions, so they apply individual approach to the separate CHP plants. Regulation is based on "cost plus profit" principals when historical data of concrete plant is analyzed. Neither technical nor economical statistical or theoretical norms are used for cost estimation. There is a significant risk to increase cost of heat (regulated product) and to reduce cost for electricity (free market product) when such regulation applied.

Heat production in the heat only boiler plants, transmission and distribution are regulated by

municipalities and these activities are paid via separate components of the final heat price. Officially approved methodology (in fact, very general cost calculation rules) is applied for heat pricing (Decision of Ukraine Government Nr 955 date 10 July, 2006). Heat prices are approved by municipalities and can be reconsidered if separate component of cost has been changed significantly (no concrete criteria for price adjustment). Application of price cap method is allowed as an option but various restrictions exist. Personnel bonuses are allowed if any cost component is improved (based on calculation). Generally, the following conclusions based on available legal acts and discussions about current situation in Ukrainian DH sector can be made:

1. No efficient planning or regulation of DH networks development;
2. Individual approach regarding disconnections or connections of new consumers  
- many large consumers bankrupted or went away – DH systems have become oversized in most cases;
3. No reliable and concentrated technical or economical characteristics of DH companies and there is no possibility to apply bench marking for cost estimation;
4. Existing laws and secondary legislation very general and flexible, too much space for individual interpretations;
5. Building-level heat metering installed in the 40 % of buildings only and very few hot water meters in apartments;
6. Heat allocation mainly related to square meters or number of people living in the separate apartments;
7. Heat losses above officially established limits are converted into the norms of heat allocation to the final consumers;
8. No serious motivation to reduce cost of heat supply or consumption;
9. Heat price regulation is in fact "political" and income for the supplied heat covers only half of real expenses;
10. Shortage of financial resources is covered mainly by municipalities from their budgets;
11. Renovation of heat production and transmission facilities is very limited;
12. Several serious accidents took place in Ukrainian DH systems when heat supply was shut down during winter time;
13. In spite of declaration in Energy strategy to promote cogeneration district heat

- systems have been decentralized in some towns of Ukraine;
14. Private investors are very skeptical about participation in operation and renovation of DH systems. Only few cases of leasing activities;
  15. Social support system has been introduced which assist poor people to pay for heating, hot water supply and other communal services;
  16. Owners of privatized apartments in the multi-flat buildings do not take care about common construction and infrastructure of the building, so heat consumption is enormous and will not be reduced in the near future;
  17. Hot water supply systems have been removed from many resident buildings;
  18. DH companies and municipalities might not be able to buy fuel and other resources for the coming heating season;
  19. Due to the critical technical and financial situation of Ukrainian DH companies state institutions try to set new heat sector regulation system to meet existing and new challenges related to increment of fuel prices and necessity to increase efficiency of DH systems. Member of Ukrainian Parliament Mr. Oleksandr Popov in assistance of several experts has prepared a draft Law on Heat Regulation (LHR). This Law has several positive statements like establishment of the National Regulator (NR) that should ensure economical regulation of communal services. NR would set prices for heat produced in heat only boiler plants, transmission and supply. Ministry of Housing and Utilities Infrastructure has established Department on Regulation (Director- Olena Gavriliuk) and several groups of experts were formed who intend to discuss and prepare basics of new regulation for the district heating and related sectors. This activity is in a very beginning<sup>s</sup> phase and no concrete documents were available at the time of visit (13-17 of July).

## *2. General recommendations on regulation of district heating sector.*

Study of Ukrainian legislation, discussions with representatives of various institutions and experience during transition period in Lithuania and neighboring countries lead to the following recommendations regarding regulation of DH sector of Ukraine:

1. Planning at the municipal level should define which territories should be heated

- by DH systems and where it has to be decentralized if not feasible;
2. Reliable and efficient operation and development of perspective DH systems must be ensured by licensing system and other mechanisms of state regulation;
  3. Real economical basis for DH sector operation should be ensured and political regulation eliminated;
  4. Concrete and clear principals for heat, hot water pricing and tariffication of related services should be fixed in the Law on Regulation or other legal acts as much as possible to exclude speculations and political impact when unpopular decisions take place;
  5. National Regulator for District Heating and Water Supply should be established or these functions could be allocated to the existing regulator - NCR. National Commission for Regulation has an experience of regulation, staff, regional offices, infrastructure etc., and this solution would be least-cost for Ukraine. National Regulator must coordinate regulation of different monopolies because they are interfaced in many fields (cost allocation between heat and electricity in cogeneration plants, differentiation of gas tariffs etc.).
  6. The main role of National Regulator should be preparation of clear methodologies, collection of technical and economical data, analysis, comparison and formation of unified technical and economical norms, standards, efficiency targets etc. for cost calculations when large number of DH companies exist and other usual functions of regulator;
  7. Price setting should be done by regional offices of Re<sup>s</sup>ulator with participation of municipalities. Final decision would be by Regulator;
  8. Regulatory reporting and monitoring, control of applied prices and licensing conditions, dispute settlement etc., among other functions of National Regulator;
  9. Investment plans prepared by DH companies should be approved by responsible municipality and Regulator;
  10. Long term (3-5 years), basic heat price methodology with adjustment to unavoided factors (fuel price, inflation, investment and climatic factor) should be introduced. Basic heat price is a maximum allowed price and lower heat price can be applied only in case if there are allocated financial resources which

- compensate lost income (usually municipal budgets);
11. District heating network must be alone on the licensed territory and licensees must ensure reliable and efficient operation, connection of new consumers and carry out other functions corresponding to licensing regulation;
  12. Competition could be introduced by National Regulator in the field of heat production: Licensed DH companies must have an obligation to buy thermal energy from independent heat producers if this business reduces cost of heat supply to final consumers. Dispute settlement could be under Re<sup>g</sup>ulator. This re<sup>g</sup>ulation stimulates industrial companies to deliver waste heat to the DH systems and similar;
  13. Building level heat metering must be implemented by law - minimal precondition for economical regulation;
  14. Apartment-level hot water metering should be introduced together with cold water metering gradually by decision of apartment owners (or municipalities) and mandatory in the multi-flat buildings in which consumption of heat and water exceed defined norms. Correspondin<sup>g</sup> financial recourses must be included in water or heat prices;
  15. Rehabilitation fee should be introduced and applied for the multi-flat buildings where heat consumption over exceed established standard. Collected money can be used for renovation of the building only (installation of heat substations or thermostatic valves, replacement of windows, thereto insulation of walls etc.);
  16. Federal and municipal support or assistance funds to DH sector should not be distributed per total amount of heat units (more support receive larger and usually richer consumers) but allocated per limited amount of heat delivered per month or year (relatively more assistance for small consumers it means poor people);
  17. Separate social support schemes should be related to obligation to participate in rehabilitation program of building. rehabilitation, payments of bills or similar;
  18. Heat sector regulation is related to development of all district energy infrastructure and housing, so state regulation should be based on systematic and clear principals and competence which should be fixed in the law system. It is

recommended to use attached guidelines (Appendix 1) or similar scheme to form such regulation for district heating sector. For pricing of heat, hot water supply and related services recommended to use scheme (Appendix 2) where price structure and responsibilities are fixed.

## Appendix 1

### GUIDELINES ON STRUCTURE OF REGULATION IN THE DISTRICT HEATING SECTOR OF UKRAINE

Nr.	Field of regulation	Regulation	Competent institution	Legal act	P.s.
<b>1.</b>	<b>Heat production</b>				
1.1.	Heat generated in "heating only boilerplants"	Long term price cap, based on bench marking	NR	LHR?	
1.2.	Heat generated in CHP plants	Competition in electricity sector. Regulation of cost allocation between heat and electricity	---- NC	LCHP?	OK OK
1.3.	Heat produced by independent suppliers	Competition, obligation to purchase heat by DHC	NR	LHR?	Dispute. setl. by NR?
1.4.	Heat produced for separate multiflat buildings only	Non regulated? Regulated?	? ?	?	Discriminat.
1.5.	Third part access	Not allowed?			OK
1.6.	Approving of investment plans in heat production plants	Municipalities? NR? Ministry?		?	OK OK OK
<b>2.</b>	<b>District heating networks development</b>				
2.1.	Expansion to the new territories	Planning, zoning, targeting? Competition with gas suppliers?	Municipalities -----	?	OK ?
2.2.	Payment for connection of new consumers	From general transmission tariff Only new consumers? Municipalities or others? Individual tariffs allowed?	NR	?	OK ? OK OK
2.3.	Disconnection from DH systems of separate buildings	Non regulated Allowed with compensation Prohibited	---- NR ----	?	? OK ?
2.4.	Disconnection from DH systems of separate flat	Prohibited		?	OK
2.5.	Approving of investment plans in heat transmission networks	Municipalities? NC? Ministry?		?	OK OK OK
<b>3.</b>	<b>Housing</b>				
3.1.	Inlet heat meters	Obligatory	DH companies	LHR?	OK
3.2.	Flat heat meters	By decision of consumers, additional fee	DH companies	LHR?	OK
3.3.	Individual heat allocators	By decision of consumers, additional fee	DH companies	LHR?	OK
3.4.	Flat hot water meters	Obligatory	Water suppliers	LHR?	OK
3.5.	Heat allocation methods	Basic methods Individual methods	NR? Consumers	LHR?	?

3.6.	Operation and maintenance of internal house piping system	Monopoly for DH companies? Competition? Both methods exist	NR? -----	?	? ? OK
3.7.	Norms for consumption of domestic cold water	Applied when metering do not exist	NR	LHR?	OK
3.8.	Norms for consumption of domestic hot water	Applied when metering do not exist	NR	LHR?	OK
3.9.	Heat norms for heating	For heat allocation	NR	LHR?	OK
3.10	Heat norms for circulation	For heat allocation	NR	LHR?	OK

NC – existing National Commission for Regulation of Ukrainian Electricity Sector;

NR – new National Regulator for District Heating and Water Supply;

LHR – Law on Heat Regulation;

LCHP – Law on Cogeneration;

CHP – Cogeneration of Heat and Electricity;

DH – District Heating

## Appendix 2

### GUIDELINES ON HEAT PRICING

	Object	Methodology	Setting	Control Monitor.	P.s.
1.	Heat pricing				
1.1.	Cost of heat generated in plants owned by district heating companies	GOU	NR	NR, municipality, consumer	Regulated
1.2.	Price of heat produced at the DH system as an indicator for competitive heat suppliers	GOU	NR	NR	Competition NR-dispute settle.
1.3.	Heat transmission price at the building-level heat meter (sale point)	GOU	NR	NR, municipality, consumer	Regulated
1.4.	Billing tariff as a component of the heat price	GOU	NR	NR, municipality, consumer	Regulated
1.5.	Additional fees for services provided individually to the buildings	Supplier	Supplier	Consumer	Individual agreement
2.	Hot water pricing				
2.1.	Price when heat and cold water purchased separately at the inlet to the building	NR	Municip., NR	NR, consumer	Lower price
2.2.	Price when hot water sold as a complex product to the flats	NR	Municip., NR	NR, consumer	Higher price
2.3.	Hot water sale (metering) tariff	NR	Municip., NR	NR, consumer	
2.4.	Hot water circulation fee	NR	Municip., NR	NR, consumer	
3.	Heat price differentiation				
3.1.	By municipal territories	NR	NR	NR, municipality	
3.2.	By district heating companies (operators)	NR	NR	NR, municipality	
3.3.	By district heating systems (for large size systems only)	NR	NR	NR, municipality	For transparency
3.4.	By fixed amount of heat delivered to consumer	NR	NR	NR, municipality	Social heat price
3.5.	Others				
4.	Service tariffs				
4.1.	Operation and maintenance of substations and piping systems inside the buildings	NR	Municipality	Consumer	
4.2.	Individual heat allocation among flats	Supplier	Supplier	Consumer	Individual agreement
4.3.	Renovation fee	GOU	Municipality	Consumer	
4.4.	Others				

GOU – Government of Ukraine;

NR – National Regulator for District Heating and Water Supply;

Consumer – individual consumer or consumer protecting organization;

## COMMENTS ON DRAFT "LAW ON STATE REGULATION IN THE HOUSING AND UTILITIES SERVICES SECTOR"

Law on State Regulation in the Housing and Utilities Services Sector (LRH) covers three main activities:

1. Centralized cold water supply and sewerage;
2. District heating and hot water supply;
3. Administration of buildings and adjacent territories;

Additionally, district heating supply system is settled in a separate act "Law on Heat Supply", and other two sectors are not described in the separate documents. Basically, it would be better to have specialized laws for all three sectors where specific features are formulated and Law on Regulation which covers aspects of regulation system only. Generally, there are different legal structure in various countries.

Positive feature of LRH is introduction of economical regulation and clarification of responsibility of state institutions in the specified fields. At the same time, there are some unclear or missing statements but they might be included in the other legal acts.

Following comments deal with the regulation of district heating sector and related fields only.

1. Terms should be described in more detail — many disputes arise when regulation comes to separate building, individual house etc. Even a term "centralized" often described in different ways (one heat supplier and one heat consumer?);
2. Law does not separate pure monopolistic activities (heat transmission) from fair competitiveness (heat delivery by independent producers, administration of buildings, for example);
3. Regulator — National Commission (NC) should ensure methodologies for building services or this activity should be based on competition basis (Article 5). Small municipalities need assistance in ratification of these services;
4. Article 7 makes different regulation "with foreign investments" (discrimination?);
5. National Commission should establish all technological norms not only for potable water (Article 7) or this function can be allocated to other responsible institutions;
6. Article 12 should specify additional principals of pricing to exclude

possibility to reduce artificially price level or delay price adjustment when unpopular decisions take place: structure (production, transmission, distribution, metering fee etc.);

- i. price cap period;
  - ii. price adjustment frequency and criterion;
  - iii. price differentiation (by license, by **DH** system, by territories of municipalities, etc.) price for heat delivered to a building (common price) and payment for services inside building (individual fees?);
7. The payment principals for connections of new consumers and compensation of disconnections are not clear;
  8. The procedures for improvement of investment plans are not clear;
  9. It should not be allowed to set heat price below an economic level except for the case when compensation for lost income has been approved;
  10. Subsidies, donations etc., should be allocated per same amount of heat delivered to each consumer, but not per total amount;
  11. Licensing conditions should be formulated in the Law;
  12. Some missing answers to important issues of regulation:
  13. Can assets be privatized or leased only?
  14. What happens if a license has been withdrawn?
  15. No requirement for implementation of metering?
  16. What is a possibility to buy heat and water at the inlet to buildings by representative of consumers?

There are less disputes and conflicts with Regulator when rules and principles are fixed in the legal acts. There are fewer possibilities for interpretations and individual regulation resulting in predictable decisions and less space for corruption. Very unpopular decisions would be made by national regulator so principals of pricing and regulation should be included directly in the law as much as possible.

Basically if the Law on State Regulation is approved in the Parliament and basic statements efficiently implemented it would stabilize situation in the district heating sector and create preconditions for normal operation.

## COMMENTS REGARDING INDIVIDUAL THERMOSTATIC VALVES

Experience in East European countries shows that individual regulation of heating by thermostatic valves and installation of heat allocators has limited effect in many cases due to the following reasons:

1. Heat for heating is allocated per m<sup>2</sup> of residential area mainly (Ukrainian case). No interest to regulate and save energy or must be introduced building level metering first;
2. Standard room temperature is only 18 — limited possibility to keep lower temperatures using thermostatic valves;
3. Internal walls are very thin usually and relatively high heat "migration" between separate apartments, poor people try to save energy using "neighbor' s" heat;
4. Installation of thermostatic valves require relatively high investment which could be utilized for higher priority energy saving means;
5. More efficient means which could be implemented in the multi-floor buildings first:
  - replacement of windows (partial compensation by the specialized state fund — good practice in Slovenia);
  - installation of individual heat substations for regulation of heating regime for separate building;
  - mandatory usage of hot water meters in the apartments;
  - balancing of heating systems etc.

In my opinion, thermostatic valves should be considered as a part of total complex renovation in case of soviet type blockhouses.