2 The Legacy of the Common Soviet Energy Past: Path Dependencies and Energy Networks

"We don't have time to waste talking about history, we only have time to talk about the energy question."

Ukrainian participant in 2000 conference on Ukraine and Its Neighbors[1]

Belarus, Ukraine, and Lithuania's ability to deal with their post-independence energy challenges was significantly affected by their pre-1991 experiences. This chapter analyses the impact of Soviet energy legacies, allowing us to get a better sense of the path dependencies limiting both the energy-dependent states' range of energy options in the post-1991 period, as well as Russia's ability to use energy as a foreign policy tool. In order to do this, the chapter first sketches the Soviet Union's transformation from energy importer to major exporter and its effects on the development of its energy relationship with its immediate Eastern European (EE) transit neighbourhood, before analysing the impact of Soviet legacies for Russia and our case studies, Belarus, Ukraine, and Lithuania.

The Soviet Union's Transformation from Energy Importer to Major Exporter

Impacts, Costs, and Contradictions

Despite having some of the largest oil and gas reserves in the world, the USSR remained a net importer of energy until the early 1970s.[2] The breakthrough came in the late 1970s, when Leonid Brezhnev's gas campaign of massive investments into Siberian gas production (especially newly

Table 2.1 Soviet Gas Exports to Non-CMEA States, 1973–1990

Year	bcm/year	Soviet gas as share of EU-27 consumption, in %
1973	6.8	4
1975	19.3	9
1980	54.8	17
1985	69.4	19
1990	110.0	26

Note: Data on Soviet gas as share of EU-27 consumption is provided for illustration purposes only, as columns 2 and 3 do not necessarily refer to the same countries, as "EU-27" includes a number of countries belonging to CMEA at the time. No composite data on Soviet gas as a share of WE states' consumption during this period was available as of this writing.

Source: Gazprom's export subsidiary Gazexport, at http://www.gazpromexport.ru/digits/?pkey1=00004 (accessed 25 June 2010). Soviet gas as share of EU-27 consumption: Pierre Noel, ESDS International Case Study, "Reducing the Political Cost of Europe's Dependence on Russian Gas," available at http://www.esds.ac.uk/international/casestudies/russian_gas.asp?print=1 (accessed 25 October 2010).

discovered supergiant fields such as Urengoy, Yamburg, Zapoliarnye, and Yamal) as a response to the fall in productivity of older fields in the European part of the country led to significant increases in production, nearly 50 percent from 1981 to 1987. (A similar process could be observed in the oil sector, with Siberian fields partially replacing production in Azerbaijan, the North Caucasus, and the Volga-Urals region and where production increased more than 20 percent between 1975 and 1980.) The Soviet Union's emergence as a major energy exporter (see Table 2.1) brought with it important changes in its relationship with both its new WE consumers and its Council for Mutual Economic Assistance (CMEA) allies.[3]

The explosive growth of energy exports to WE was accompanied by the development of a massive energy export infrastructure. Despite sanctions imposed by the United States' (US) 1974 Jackson-Vanik amendment, the development of major pipelines to serve these new exports was not to be stopped.[4] The first of these, the Brotherhood (Bratsvo) gas pipeline linking Czechoslovakia and Ukraine, was inaugurated in 1968; followed by, among others, the Oremburg (Soyuz) (1978) and Yamburg (1984) pipelines.[5] (This is in addition to the Druzhba [1964] and other oil pipelines.)

The Soviet-CMEA Energy Relationship: Patterns, Legacies, and Contradictions

The growth of exports to WE was accompanied by the transformation of the East European CMEA states into the Soviet Union's immediate energy transit neighbourhood and the spectacular growth of their energy dependency on the USSR.[6] Playing an important transit role, the CMEA transit states exhibit important parallels with post-1991 Ukraine, Belarus, and Lithuania, and a brief look at their relationship with the USSR can help us gain a more nuanced historical understanding of the limitations involved in the use of energy supply dependency for political goals.

OVERWHELMINGLY BILATERAL RELATIONSHIPS: USING ENERGY TO REWARD PRO-SOVIET, PRO-CMEA ALLIANCE BEHAVIOUR

Despite the attempt to turn the CMEA into a model cooperative institution as a way to compensate for the damage in relations brought about by Joseph Stalin's heavy-handed policies vis-á-vis EE, multilateral CMEA energy cooperation remained limited, with members often at odds on how to collaborate or (as in the case of Romania, the only country in the region with significant domestic energy supplies) seeking to maintain a cautious distance from its projects.[7] Given this situation, CMEA energy cooperation became a de facto vehicle for bilateral cooperation between the USSR and individual states, and supplying Warsaw Pact allies with subsidized energy largely a means for Moscow to manage relations with individual states. CMEA pricing rules included a degree of flexibility, allowing the USSR to discriminate bilaterally in its dealings with individual members,[8] and to use energy prices as a tool of alliance management. However, some of the means used, such as the barter of energy supplies for transit, pipeline construction services, and goods not easily available in the USSR, created problems of their own. In particular, the largely nontransparent nature of these mechanisms and of CMEA's pricing procedures created new tensions and a legacy of mistrust in the relationship, as, with widely distorted prices, each side could claim it was being exploited in the trade relationship.[9]

LIMITATIONS TO THE USE OF ENERGY AS A POLITICAL TOOL

Moreover, using energy subsidies to reward alliance loyalty had important limitations. The USSR was limited in its ability to use energy-based negative sanctions as, instead, it was "constrained to use its energy and other resources to bail out" Eastern European regimes in trouble, regardless of their degree of loyalty, as happened in the case of the Czechoslovakia (1968) and Poland (1970 and 1981).[10] In addition, going too far in forcing CMEA allies to meet their energy needs in the international market would have led these countries to become more economically involved with the West, if only to raise enough hard currency to pay for these imports.[11] Thus, although the CMEA states' growing energy dependency on the USSR gave it enormous potential influence over them, supporting these high levels of dependency was costly, making clear the limits to the use of energy supplies for political goals.[12]

Up to which point do we see a repetition of these patterns in the energy relationship between Russia and the post-Soviet energy-poor transit states? Despite important differences in the political and historical circumstances surrounding these two sets of relationships, interesting parallels can be seen in a number of areas.

First, despite the high cost of energy subsidies, in the same way as the Soviet leadership was apprehensive about pushing the CMEA states too far into diversifying away from Soviet energy supplies out of fear this may lead them to develop increasingly close relations with the West, a possible rationale for continuing low energy prices to Belarus and Ukraine after 1991 was (as will be discussed in chapters 4 and 5) to prevent these states from considering diversification projects, keeping them bound to Russian oil and gas. By offering low prices in the short term, Russia helped keep diversification – which, especially in gas, required significant investments in new infrastructure and higher prices in the short term – largely out of the game as a realistic option.

Second, the CMEA experience also tells us much about the limits of energy as a means to pursue foreign policy goals. Such political use of energy supplies took place within the context of other key processes, such as competition between the USSR's three main energy markets (domestic, Eastern European CMEA, and Western European), already visible in the early 1970s. Moreover, if, indeed, energy subsidies were used as a means to reward alliance loyalty, as discussed before, there were serious limits on the Kremlin's ability to use negative energy sanctions vis-à-vis its CMEA allies. As will be discussed in chapter 5, this is a situation Russia has encountered once and again in its relationship with Belarus under President Aleksander Lukashenka, not least because of the political and economic backlash that such sanctions could create for Russia itself.

Increasingly Contradictory Role of Energy Exports in Soviet/Russian Economic Development.

The contradictions visible in the Soviet Union's costly energy relationship with its CMEA allies were representative of much more fundamental contradictions inherent in the role of energy exports in Soviet political and economic development. On the one hand, the expansion of energy exports to WE brought with it significant economic rewards. By 1985, the USSR was receiving more than 75 percent of all hard-currency revenue from oil and gas exports;[13] it is estimated that, at their peak in 1981, oil and gas profits amounted to more than 40 percent of the Soviet GDP.[14] By the mid-1980s, energy exports had become essential to the functioning of the Soviet system as a whole.[15]

Yet the push for larger exports was not without negative consequences. The shift East of oil and gas production, exemplified by Brezhnev's gas campaign program, increased production and transportation costs significantly, and monopolized such a high share of investment that it virtually paralyzed industrial modernization in other areas.[16] The success of energy exports increased pressure to produce more, which, given prioritization of physical volume-of-production targets over profit, meant oil was often produced even if costs were higher than world market prices.[17] It was estimated that by the late 1980s – with the cost of producing Soviet oil increasing and world oil prices decreasing – the marginal costs of oil extraction and transport may have exceeded export prices.[18]

Finally, income from energy exports may have actually hastened the collapse of the Soviet economic system by allowing the Soviet leadership to deal only with the symptoms of its growing crisis (through the financing of agricultural and consumer goods imports, for example), rather than engaging in much-needed systemic reforms.[19]

Legacies and Path Dependencies for Post-Soviet Russia

The Soviet energy system left important legacies for Russia, affecting the Russian state's ability to use energy as a foreign policy tool, as well as the value-added chains and incentive structures open to various Russian energy players, in turn affecting their interactions with local players in the energy-poor states. These legacies have to do first and foremost with the type of energy development strategies that were pursued, the low levels of energy efficiency built-in into the system, the types of energy mixes it encouraged, infrastructural legacies, and the types of trade arrangements that were privileged.

Soviet Patterns of Energy Resources Development

Soviet energy development emphasized increasing short-term supply at almost any cost. Production techniques focused on quickly extracting gas and oil located in easy-to-reach parts of deposits, but made it much more difficult – and expensive – to get at the remaining parts of these deposits later on. The use of such predatory exploitation (*Rauberwirstchaft*[20]) methods led to the premature exhaustion of many oil and gas fields from the 1960s on. By the 1990s such methods had made a large number of Russia's oil fields unprofitable, increasing the pressure – and temptation – for many oil companies to rely on state aid.[21]

At the same time, Soviet pricing methods did little in terms of signalling relative scarcities or the relationship between supply and demand.[22] On the contrary, the setting of allowable prices on the basis of expenditures on production (cost-plus pricing), rather than supply and demand provided little incentive for reducing production costs. The fact that costs for energy infrastructure were "managed from a budget entirely separate from revenues generated by energy"[23] further contributed to unrealistically low prices often not covering the full costs of production. In particular, little attention was paid to indirect costs, especially environmental costs, which were kept out of price considerations and policy-planning in general.

Low energy prices also affected the design of pipeline systems. With gas prices low, pipelines were built with an emphasis not so much on efficiency but on saving on expensive, often imported components such as compressor stations, making these pipelines less efficient than similar pipelines elsewhere. This had important implications for the post-Soviet period, as, given the significant amount of gas used to operate the pipelines themselves, reduced pipeline efficiency leads to less gas available for exports.

Lack of Incentives for Increasing Energy Efficiency

The pricing mechanisms discussed above played an important role in hindering gains in energy efficiency. Low energy prices created the illusion of inexpensive energy, discouraging energy-saving measures,[24] and contributing to levels of energy efficiency five or more times lower than in WE states.[25] Moreover, the calculation of energy (especially coal,

whose quality varies widely) production in terms of volume rather than caloric value or thermal units encouraged production for production's sake and did little to stimulate improvements in quality.[26]

Systemic factors – in particular distorted price signals and the dominant role of energy-intensive heavy industries – also limited the impact of conservation measures that could be introduced in specific areas of the economy.[27] A supply-oriented energy policy meant that, in situations of crisis, increasing supply at almost any cost was often the default answer, rather than limiting demand. A deeply ingrained over-concentration with fulfilling the plan meant that, if the choice was between not fulfilling output targets and fulfilling them using more energy than stipulated, "plan targets enjoyed priority regardless."[28]

This legacy of inefficiency had important implications for energy relations with the energy-poor states. At first glance, the most obvious implication would be that Russia still has large reserves of energy savings, which, once tapped, could mean more gas and oil available for export. At the same time, as will be discussed in chapter 3, due to the problems in Russia's energy production system, hydrocarbon production stagnated after 1991.

Energy Mixes

The 1970s gas campaign, the widespread use of gas-fired electricity generation, as well as the gasification of towns and cities along export pipeline routes, led to momentous changes in Russia's energy mix. With the swift move away from coal, other solid fuels and firewood (from 62.5 percent of Total Primary Energy Supply [TPES] in 1960 to 17.9 percent in 1991) and into gas (from 8.2 percent in 1960 to 45 percent in 1991), the increasingly large role of gas in the Russian energy balance (52.2 percent in 1999) is an important legacy of this period.[29] Energy mixes affected the relationship with the energy-poor states, as they affected how much of the gas produced in the USSR would be available for export (and, plausibly, for use for foreign policy purposes), and the behaviour of various Soviet energy actors active in both domestic and international markets.

Trade and Institutional Arrangements Inherited from the Soviet Period

The Soviet period left important trade and institutional legacies. Barter-type trade made energy-related financial flows difficult to verify and made it hard to enforce legal control over the assortment of semi-legal

and illegal deals taking place in the sector, from tax evasion to asset-stripping, as became clear in 2001–2002 with the unearthing of serious allegations involving Gazprom's deals for the benefit of gas trading company Itera.

The actual organization of the energy sector would also leave long-lasting legacies. If on the one hand ultimate responsibility for strategic energy decisions was held by the State Planning Committee (GOSPLAN) and the Communist Party of the Soviet Union (CPSU) Politburo, actual production was fragmented among several branch ministries, each controlling the production of a particular fuel; exploration activities were further divided between the Ministry of Geology and the specific energy-producing ministries.[30] In addition to creating serious coordination problems at the time,[31] this fragmentation of the energy policy process would lead to additional policy making difficulties for the post-Soviet states inheriting these structures.

On the other hand, oil and gas exports were centrally controlled by foreign trade organizations specialized in a particular fuel, in the case of gas export monopolist Soyuzgazeksport, whose role was inherited by Gazprom's export division Gazeksport; Gazprom itself is the successor of the Soviet Ministry of Gas Production.[32] Thus Gazprom became the heir to an impressive infrastructure, including not only a vast network of pipelines and production facilities, but also less tangible assets such as profitable long-term contracts with WE, contractual relationships with former CMEA states, and control over Russia's domestic gas transit system (see chapter 3). The growth of export pipelines to WE was accompanied by the development of no less significant institutional and personal relationships with WE national gas monopolists, ties that, inherited by Gazprom, have continued to be significant after 1991; such ties have at times been perceived as compromising the interests of the energy-dependent countries through which Russian oil and gas transit on the way to these markets.

Income from Oil and Gas Exports Traditionally Used to Delay Reform

As discussed previously, high world oil and gas prices – as in the 1970s – allowed the Soviet Union to delay much-needed reforms. This connection proved strong in the post-Soviet period as well, when calls for the reform and de-monopolization of the gas sector were delayed by fears that they may negatively affect the sector's continued ability to produce high foreign-currency revenue. These fears not only helped keep

Russian reform hostage to the ups and downs of the sector, but also helped maintain Gazprom's export monopoly. This situation directly affects the energy-poor states, as they will be greatly hindered in their ability to access lower gas prices until there is a real liberalization of the Russian gas export market; moreover, as will be discussed in the next chapter, without a real reform, few incentives remain for Russian gas production, processing, and distribution to become more efficient.

Legacies and Path Dependencies for the Energy-Poor Transit States

Despite having gained full political sovereignty in 1991, Ukraine, Belarus, and Lithuania continue to be affected by Soviet energy legacies. Although the phrase "Soviet legacies" first brings to mind images of massive pipeline networks, these constituted only one of their elements; other important aspects included energy resource development policies, the patterns of development and dependency relationships built into the system, the types of energy mixes it favoured, infrastructural legacies, policy making, and institutional arrangements, as well as energy-cultural legacies and the mental conceptualization within which these countries would be able to deal with their energy poverty.

Decisions on which Energy Deposits would be Developed in the Non-Russian Republics of the USSR

Moscow kept strong control over the energy development policies of Belarus, Lithuania, and Ukraine, as key decisions took place not at a republican, but at a Union level and were based not so much on bargaining between both sides, but on central planning extended to the various republics.[33] If there was a degree of fragmentation in day-to-day energy production decisions, it was an administrative, not a republic-based division, and republican self-sufficiency was not a consideration. Well-integrated into the CPSU ruling elite, the leadership of pre-independence Belarus, Lithuania, and Ukraine did not seem to have a self-aware republic-centred concept of energy security.[34]

In particular, decisions made in Moscow affected the republics' medium-term energy prospects through the issue of which energy resources would or would not be developed, and how. Ukraine, the only one of our case studies to have ever been an energy exporter, is especially illustrative of how Soviet policies were instrumental in turning a whole republic, in the space of a few decades, from a net energy exporter (and the second most important energy producer in the USSR) in the 1960s to a net importer;[35] by 1988, its energy deficit amounted to 42 percent of consumption.[36] As stated by Dienes, "no other region or republic has seen its energy position change so rapidly for the worse than Ukraine."[37]

The specifics of Ukraine's swift change from virtual self-sufficiency to dependency provide important evidence as to how the system worked in practice. First, many of Ukraine's oil and gas reserves were not exploited, in favour of regions considered more advantageous for exploitation by Moscow, such as Siberia and CA.[38] A second set of reasons had to do with *how* these deposits were developed. Central planning decisions calling for large Ukrainian energy (especially gas) supplies to other Soviet republics and foreign states, together with the use of predatory exploitation methods, led to the heavy over-working and premature peaking of Ukrainian fields in the 1970s,[39] forewarning Ukraine's later energy dependency on Russia. In addition, inefficient policies made the marginal cost of fuel production in Ukraine, especially coal, exceptionally high; by 1991, most of Ukraine's coal production was taking place at a heavy loss. This legacy has continued to affect the industry since then, limiting coal's ability to make a significant contribution to Ukrainian energy production and self-sufficiency.[40]

Patterns of Economic Development: A Legacy of Dependency

Soviet patterns of economic development encouraged the energy-poor republics to adopt a heavy industry-centred, energy-intensive development strategy based on energy abundance, when, considered individually, they were energy poor. With generous cross-subsidization keeping this system alive despite its clear inefficiency, energy consumption grew significantly in the late Soviet period.[41]

These legacies help explain why countries such as Ukraine and Belarus continued to live according to a developmental model based on cheap and easily available energy well after they became dependent on external sources. The social importance of the energy-intensive heavy industrial sector, especially in terms of employment, also helps explain why it was so difficult for these states simply to close inefficient factories and move to a less energy-intensive development model after 1991.

As will be discussed in chapter 6, the Lithuanian case presents a somewhat different situation, as a heavy industry-based model of development never took root there as strongly as it did in Ukraine or Belarus.

As a relative latecomer into the Soviet Union (forcibly incorporated in 1940), Lithuania was not as deeply affected by Soviet industrialization methods as were Ukraine or Belarus. Moreover, there is evidence that the leadership of Soviet Lithuania successfully sought to prevent Moscow-directed heavy industrialization and the concentration of industry in one or two geographical areas from affecting Lithuania as heavily as it did the other Baltic republics.[42]

If this structural element (smaller dependency on heavy industry) made it easier for Lithuania to engage in post-independence economic restructuring, cultural-political considerations, especially the circumstances under which Lithuania acquired independence, also played a role. When Lithuania acquired independence, this did not happen by accident (as some would argue was the case in Belarus), or as a result of an implicit nomenklatura bargain (as some would argue was the case in Ukraine[43]), but as the result of a broad effort to reestablish independence. This fact undoubtedly played an important role in helping the population come to terms with the social costs of economic restructuring, making it possible for the country to embark on a more decisive course of post-independence economic restructuring than did either Belarus or Ukraine.[44]

Energy Mixes

Soviet legacies also affected the dominant types of energy supply mixes in the energy-dependent states. The building of pipelines to service gas exports to WE created incentives for the further domestic gasification of the transit republics, with long-term effects not easily reversible after these pipelines were already in place. The refitting of many power plants and industries from their traditional fuel, coal (and later, heavy oil), to gas, served to solidify these changes. As a result of these factors, by 1991 Ukraine, Belarus, and Lithuania had high levels of gas in their energy mix, in line with the situation in countries possessing large gas reserves (such as Russia or the Netherlands), but not reflecting their situation as gas-poor countries.[45]

Another important legacy of the Soviet period was the building up of a significant – if of questionable safety – nuclear power sector in Lithuania and Ukraine, leading to a continuous growth in the share of domestically produced nuclear energy in their TPES, which by 1990 had reached 7.9 percent in Ukraine and 27.8 percent in Lithuania.[46] While at first glance nuclear power could provide a basis for energy independence by providing an alternative to Russian gas and oil imports, the growing domestic and international campaign against nuclear power, and Russia's monopoly on nuclear fuel supplies, made this possible source of diversification an unrealistic one for the first fifteen post-independence years. (Chapters 5 and 6 discuss the resurgence of interest in nuclear power in Lithuania and Belarus after 2005.)

Development of Strategic Infrastructure

Infrastructural legacies have been crucial for the energy-poor states. Of these legacies, the most important have to do with the development of Russia-centred pipeline systems, refineries, gas and oil storage facilities, and other energy-related industrial infrastructure.

RUSSIA-CENTRED PIPELINE SYSTEMS

The energy transit and distribution system constituted the crown jewel of Soviet energy legacies. Pipelines were built with Union-wide supply goals in mind, not from the perspective of assuring security of supply to each individual republic. This infrastructure was largely centred on Russia, in part due to the fact that most energy consumers were located there. Thus, for example, the gas pipeline connection between Turkmenistan and Ukraine was longer than a possible direct route, as it was not conceived in terms of supplying Turkmen gas to Ukraine at the lowest possible transit cost, but in terms of supplying various Russian cities along the way. This infrastructure was also Russia-centred in the sense that it was controlled by the Union ministries of gas and oil production, located in Moscow. The legacy of hub-and spoke pipelines centred on European Russia greatly limited the energy supply options open to the energy-poor post-Soviet states after 1991, as it provided no usable connections to WE energy networks.

Moreover, there were no direct pipelines in place for these states to be able to import oil and gas directly from emerging producers such as Azerbaijan and Turkmenistan, making those supplies dependent on transit through Russia's pipeline system, and giving Russia the power to manipulate access for political or commercial reasons. Gazprom, seeing CA gas as competition in the WE markets, has at times denied this gas access to its transit grid, imposed punitive transit fees, or has otherwise subjected it to political manipulation.[47] As discussed in chapter 1, Gazprom has also sought to gain ownership over gas pipelines located in the transit states. Lithuania (and, after 2009, Ukraine),

with EU help, have taken steps to build connections with existing WE energy networks, but the task is enormous given the overwhelming cost of building new pipelines and the existence of long-term contractual relationships with Russian exporters, which complicate financing issues.[48]

The conceptualization of pipeline systems in Union-wide terms also meant that some infrastructure was not built, as it was simply not deemed necessary. This was often the case with gas metering stations – with the Soviet gas and oil pipeline system administered as a single whole, no metering stations were set up at republican borders – as most notoriously evident in the case of Ukraine.[49] This had important consequences, as the country had to depend on Russia for data on how much gas it had imported, and unequivocal import data was difficult to access. (If pre-1991 legacies and the expense involved in setting up such metering stations partially explains their absence as of 2009, it is likely that their absence was also closely related to lack of interest on the part of important post-1991 actors benefitting from the lack of transparency and additional rent-seeking opportunities facilitated by the lack of such metres.)

SELECTIVE DEVELOPMENT OF GAS AND OIL STORAGE FACILITIES

Following the 1973–1974 oil crisis, most WE countries started to establish systems of oil (and, later, gas) stocks in order to safeguard their energy security, and as a means to gain increased bargaining leverage vis-à-vis suppliers. This was not the case in the Soviet republics. Receiving most of their gas and oil from Russia, the very idea that it would be necessary to maintain gas and oil stocks to bargain for better prices or ward against a possible crisis was foreign to their policy making context; in particular, decisions on whether to build gas storage facilities were made on the basis of the needs of the Soviet gas export system, not of each republic's needs. In those cases where large storage capacities did exist (Ukraine), these were built during the Soviet period in order to "park" gas before further transit to WE. While not originally intended to boost Ukraine's energy security, these facilities remained in place after independence, available for use by Ukraine.[50]

LOCATION OF REFINERIES AND OTHER ENERGY-RELATED INDUSTRIAL INFRASTRUCTURE

Ukraine, Belarus, and Lithuania also inherited large oil refineries originally built as part of a Union-wide system. Remaining on their

territories after the demise of the USSR, they became part of the energy infrastructure of much smaller independent countries. Able to work profitably only as part of a larger network guaranteeing regular crude oil supplies and access to sale markets throughout the former USSR, the virtual dissolution of Union-wide supply and sale markets and the end of stable oil supplies from Russia in the early 1990s led to a virtual paralysis of the sector in Belarus, Ukraine, and Lithuania.[51] By 1999, these effects had made countries such as Ukraine especially receptive to Russian oil companies' offers to take over refineries in debt-for-shares deals; by 2002, most Ukrainian refineries were under the control of Russian oil companies. Existing refining infrastructure also affected the contractual diversification options open to these states after 1991, as individual oil refineries were linked with specific production areas in Russia, in turn controlled by specific oil companies.[52] In addition, the location of industries producing energy-related machinery (such as steel pipes used in pipelines) created long-standing links of interdependency.[53]

Other characteristics of the gas transit infrastructure as it developed during the Soviet period were to have long-term consequences as well. For example, Ukraine's gas transit system is only partially separated from the domestic high pressure system, which means most large Ukrainian gas consumers are connected directly into the transit pipelines.[54] This limits Russia's ability to target a gas supply curtailment – as a means to pressure for payment of gas arrears – to domestic Ukrainian users only, without affecting transit to WE.

SIZE OF ENERGY INFRASTRUCTURE RELATIVE TO REPUBLIC'S SIZE AND EXCESS GENERATING CAPACITY

Belarus, Lithuania, and Ukraine inherited energy structures intended to work as part of a Soviet-sized whole, not for individual republics. Indeed, for each of them a crucial Soviet legacy is the excess of installed energy generation and processing infrastructure relative to actual domestic needs. While this excess capacity manifested itself differently in each case – in the form of excess oil refining capacity (Belarus) or of a largely nuclear-based electricity-generation capacity (Ukraine and Lithuania) – it also created common challenges after 1991.

Having a large electricity surplus did not necessarily benefit these energy-dependent states, as they lacked the means to store much of the generated electricity and their ability to export it was limited by the lack of connections with EU electricity grids. This is especially so in

the case of nuclear-based electricity generation capacities, which cannot provide for the totality of a system's needs, as, being hard to regulate and turn on and off, need to be combined with other, easier to regulate forms of electricity generation such as gas-based generation. With local consumption only a fraction of what the generating infrastructure was able to produce (an especially big problem during the early-1990s economic slump immediately following the Soviet dissolution), maintaining oversized generating capacities increased per-unit production costs, reducing the competitiveness of these countries' exports and creating a burden on the economy as a whole.[55]

State Capacity and the Role of the State and Other Actors in Energy Policy Making

Soviet legacies affected the possible role of the state in the *management* of the post-independence energy situation. They did so in two main ways. First, through the issue of state capacity in energy policy making and in the control of energy infrastructure located within its territory. Second, through the issue of which actors would emerge as crucial policy making players, challenging or preempting the state from playing a guiding role in energy policy, and affecting energy governance patterns.

Soviet energy legacies affected the (non-Russian) post-Soviets states' capacity to exercise control over energy policy. In contrast with Russia (the centre), Ukraine and other former Soviet republics inherited from the Soviet state mainly nominal institutions, ("little more than mailboxes for orders from Moscow"[56]), with responsibilities often too large for them to handle in the immediate aftermath of independence. In addition, as energy links between the Soviet republics were controlled from Moscow, once formal ties with the centre were abruptly cut, the new states had few horizontal connections with other post-Soviet states, while still not being part of international energy treaties and networks.[57] This limited their energy policy making capacity in the post-Soviet period.

With their energy industries largely managed directly from Moscow by branch-specific Union ministries until 1991, Belarus, Lithuania, and Ukraine inherited not so much complete, ready-to-use energy infrastructures and policy structures, as fragments of structures, in particular "fragments of policy structures."[58] This legacy was exacerbated by the absence, at a republican level, of single dedicated ministries dealing with energy as a whole and that could smoothly and proficiently reassemble these fragmented structures, now with republican-level goals.

The effects of such fragmentation could be seen especially clearly in the nuclear energy sector, where Ukraine and Lithuania, despite inheriting large nuclear facilities, "lost the key Soviet structures which had always managed them," while having no equivalent republican-level structures to replace them.[59]

Soviet legacies also affected the role of specific interest groups in energy governance and their ability to challenge or preempt the state from playing a guiding role in energy policy. In the first place, in the Soviet period links within enterprises were stronger than links between these enterprises and the *republican* governments. Second, the system of Moscow-based branch economic ministries meant that enterprise directors in the various republics, depending directly on Moscow, often had little or no contact with the republican capital.[60] In the third place, the economic and political weight of heavy industry supported the rise and consolidation of elites connected to energy-intensive industries such as petrochemicals, metallurgy, and chemical fertilizers. This powerful industrial lobby would come to have an enormous weight in the policy process, especially during the first years after independence, power it would often use to attempt to bloc economic reforms as a way of maintaining its access to state subsidies, including energy subsidies.

Trade and Institutional Arrangements Inherited from the Soviet Period

The legacies of a trade system not based on real prices and cash payments set the stage for a number of problems in the post-1991 period. Because the nominal price of energy supplies meant little to the buyer, inefficiency was promoted.

Many of the energy trade instruments developed during the CMEA period continued to be used after 1991. Paying for energy by supplying the USSR with soft goods hard to export to Western markets, a practice often used in CMEA energy barter, was also an important feature of post-1991 energy relations between Russia and Belarus, where much of the gas and oil supplied by Russia was bartered for Belarusian goods unable to be placed in other markets, and at strongly inflated prices. The persistence of barter relations – which continued to play a central role in energy trade with Ukraine and Belarus throughout the mid-2000s – had a variety of other important effects. While itself often a response to lack of liquidity in the market, barter led to further demonetization of the energy sector and loss of investments.[61] Most importantly, it helped perpetuate a nontransparent environment prone to rent-seeking and corruption. Barter practices made it more difficult

to establish the price paid for gas actually supplied, opening the door to potential misunderstandings.

Another important legacy had to do with the role of monopolistic energy structures, such as centralized electricity suppliers and oil and gas exporters. The persistence of these monopolistic structures created special difficulties for countries such as Lithuania (and, to a lesser extent, Ukraine) seeking to adapt to EU regulations. In particular, the legacies of a single monopolist controlling all aspects of the electricity production and distribution process created important hurdles for the liberalization and unbundling of production, transportation, and distribution in electricity and gas markets. These challenges are compounded by the legacy of high reliance on gas, which raises the political costs of increasing consumer gas prices, in turn making it difficult to open the market for competition, as it is unfeasible to open the gas market without allowing companies to charge market prices for the gas supplied.

In addition, one point in Soviet gas export contracts would come to have significant importance in the post-Soviet period: the fact that export contracts to European countries usually specified delivery points well beyond the *Russian* border. (In the case of exports to WE, usually a point on the Western border of a CMEA state such as Baumgarten on the Czechoslovak-Austrian border; in the case of exports to EE, usually a point on the Western Soviet border, such as Uzhgorod on the Ukrainian-Hungarian border.[62]) This legacy has had significant effects, as it means the cost and burden of transit and possible transit complications continues to fall first and foremost on Russia.

Energy Culture and Conceptualization of Energy Security

Another important set of Soviet legacies concerns cultural and mental frameworks: the geographical scale at which energy issues were conceptualized, and the energy-related expectations of the population.

The first issue concerns the geographical scale at which energy issues where conceptualized. In the cases of Ukraine and Belarush in the first years after independence, most economic elites continued looking at energy in Union-wide terms, not in terms of their own state. Thinking in terms of a Soviet-wide energy balance, they continued to see energy inputs as basically unlimited, and to feel as if they lived in an energy-rich state.[63] The realization of their own country's energy poverty came only gradually.

The second issue concerns what could be called Soviet energy culture. In the same way as cheap and plentiful energy supplies served as

a bonding agent that kept the Soviet economy – however inefficiently – together, expectations of cheap and reliable electricity and piped-in residential heating supplies became part of the Soviet population's cultural definition of welfare, and part of a minimal energy-social contract between the regime and its citizens, making household consumers carriers of Soviet energy culture.[64] Such expectations of energy-related welfare, part of general expectations of rising living standards, became part of the very legitimacy of Soviet power, in a context in which ideology was becoming less and less central to this legitimization. Even after the demise of the Soviet system, being able to provide such services has been a central element of the new states' legitimacy vis-à-vis their own citizens.

This contributed to a situation where, for the post-Soviet states (and especially for those such as Belarus lacking strong and widely influential elites articulating more identity-based sources of legitimation), the continuous provision and expansion of residential energy services, especially to the countryside, became an important legitimation element for both the states themselves and for their leaders. Implied in the provision side of this unspoken social contract was the expectation of affordable energy prices, an area where the Soviet legacy of extremely low prices had created enduring expectations.[65] Thus a growing emphasis on the absolute importance of low energy prices starts to take shape; the rise of such expectations to a central value was aided by the economic crisis and high inflation of the early 1990s, which reduced household incomes and would have made hypothetical cost-covering, inflation-indexed energy prices much more difficult to afford for the average household.

This had important effects in the short and medium term: an overconcentration on the short-term continuation of low energy prices served to exclude some policy options from the discussion table, while making others much more attractive.[66] Low residential prices isolated consumers from the worst effects of energy dependency on Russia and "made diversification policies, more expensive in the short term, hard to sell politically."[67]

Conclusion: Soviet Legacies, Rent-Seeking, and Asymmetrical Interdependence

The Soviet legacies discussed in this chapter synergized with other characteristics of the transition period (first and foremost thwarted or

partially delayed economic reforms) and of the external environment at the time (in particular Russia's desire for continued influence in the other post-Soviet states, which led to the maintenance of barter and other murky multiple-pricing schemes for energy[68]) to greatly facilitate the development of rent-seeking opportunities after 1991. Taken together, these factors contributed to a situation where energy trade became one of the most corrupt areas of the economy, and set into motion a type of institutional dynamic whereby some powerful economic actors would have little interest in increasing transparency in energy trade, especially vis-à-vis the main supplier, Russia.

At the same time, these legacies are not simply one-sided dependency legacies. For example, the same infrastructure originally built to guarantee security of exports for one actor could eventually come to be used to facilitate security of supplies for another, as was the case with gas storage facilities built on Ukrainian territory that, although originally intended to support Soviet exports to WE and not Ukraine's energy security, later became a significant element of Ukrainian counterpower in its asymmetrical interdependence energy and energy-transit relationship with Russia.

Legacies do not explain everything, however. Important differences between our cases were a result not so much of Soviet legacies but of choices made in the early post-Soviet years, in particular the speed of economic reforms, level of state control of the economy, and the nature of political control, governance, and interest representation. After considering the effect of domestic Russian factors in the energy relationship with the energy-poor states (chapter 3), we turn to these issues in more detail in the case studies of Ukraine, Belarus, and Lithuania.