Localizing governance of systemic risks: a case study of the Power of Siberia pipeline in Russia

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Abstract

For the past three decades, risk has occupied center stage in the energy discourse. Systemic risks have proven particularly challenging for government energy planners and corporate executives, as they are characterized by their complexity, uncertainty, ambiguity, and ability to causing ripple effects throughout economic, social, and political structures. In this article we analyze two approaches to governing systemic risks arising out of energy mega-projects, one mandated under the Russian legal and regulatory regime and one employed by the largely indigenous hunters, fishermen, and reindeer herders residing in the Sakha Republic. Our study focuses on the 4000-kilometer-long natural gas transmission system "Power of Siberia" to be constructed in the sub-Arctic part of the region. We employ a complimentary and corroborative analysis of legal texts, fieldwork observations, semi-structured interviews, and transcripts of official meetings. We establish that the approach to risk taken by the people who occupy the land that the Power of Siberia traverses could provide a useful insight for handling systemic risks in connection with pipeline transportation systems. We also determine that the current Russian legal and regulatory regime fails to provide an adequate basis for governing such risks. We conclude the article by identifying four pathways for integrating valuable elements of the indigenous approach into the current legal and regulatory framework.

I. Introduction

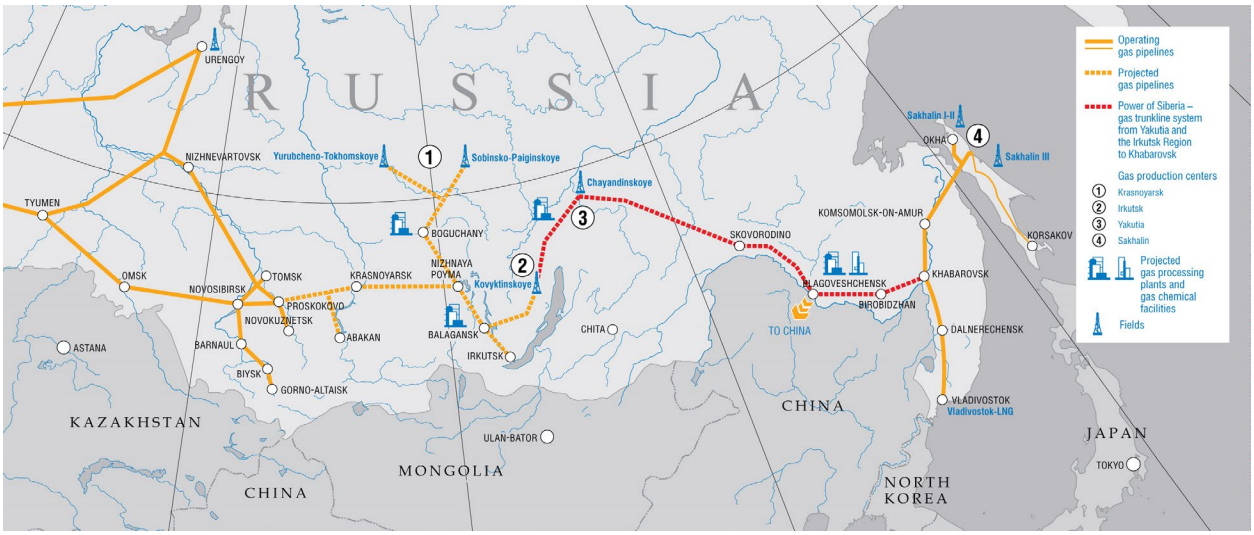
The term "risk" is *en vogue* in the energy sector. Helge Lund, former President and CEO of Statoil, went as far as to declare that modern oil companies resemble risk management companies, and it is hard to disagree. [1] Oil and gas companies of Statoil's caliber manage complex supply chains, develop technologically advanced projects, and forge and maintain alliances with other energy companies, national governments, and local communities. They are doing this in the environment of price volatility and constantly changing geopolitical landscape.

Lund's statement is hardly an anomaly. "Risk" has become an operative word in virtually all industrial and service sectors. From bisphenol A contained in infant bottles to "too big to fail" financial institutions, risk has become the prism through which the pros and cons of economic activities are assessed. This "rise of risk" in the twentieth and twenty-first centuries is well researched, documented, and conceptualized. This is not say that people did not consider the consequences, both positive and negative, of engaging in various activities prior to the modern age; they certainly did. However, the rapid proliferation of science and technology in both the betterment and destruction of human lives, represented by industrialization and urbanization on one side and two world wars on the other, gave risk a defining role in modernity.[2]

The overarching purpose of this article is it to contribute to the investigation of risk's role in the modern energy systems. In order to achieve this objective we compared and contrasted two approaches to handling risks, one mandated under the applicable legal and regulatory regime in the Sakha Republic located in the Russian North-East and one employed by the largely indigenous hunters, fishermen, and reindeer herders residing in the province.[i] Our investigation targeted systemic risks arising out of large energy projects and uses the 4000 kilometer-long natural gas transmission system "Power of Siberia" as a case study. (Figure 1) Our ambition was to utilize risk theory, and the concept of risk governance in particular, as the departure point, and combine legal and ethnographic analysis to investigate the "prescribed" and "implemented" or "applied" models of dealing with systemic risks associated with energy mega-projects.

Figure 1 Gazrpom's Natural Gas Production Fields, Exploration Areas, and Transmission and Processing Facilities in Eastern Russia

Source: gazprom.com[3]



We attempted to fuse the data and analysis that came from four different studies that span five years. We relied on the following sources of data: (1) results of our fieldwork in the Neryungryi and Aldanski districts (ulusy) of the Sakha Republic conducted in November 2014 and January-February 2015; (2) texts of the applicable federal and regional laws and regulations enacted and promulgated to assess various impacts of energy projects; and (3) 99 publicly available transcripts of Russian presidential official meetings, speeches, and remarks between November 2008 and March 2015 in which matters pertinent to the energy sector were discussed.

Reindeer herders, hunters, and fishermen of the Neryungryi and Aldanski districts of the Sakha Republic are ethnically either Yakut (Sakha) or Eveny. Only the latter of which are officially recognized as indigenous, while the former count as a non-Russian "titular nation" that has its own administrative unit in the Russian Federation called Republic of Sakha (Yakutia). The latter is

[i] The proper name of the region is the Republic Sakha (Yakutia). The Sakha Republic is a sub-sovereign and territorial unit within the Russian Federation. In this article, we use Sakha and Yakutia interchangeably.

Russia's largest territorial unit, where nearly one million people inhabit a territory of just over 3 million km^2.[4] While they officially all live in settlements, such as the villages of Iengra and Khatystyr, they lead a mobile lifestyle, spending much time in the forest. They often also live in the bigger towns of Neryungryi and Aldan, where all the administration and infrastructure is concentrated. This multi-sited lifestyle influences their perception of industrial development and its associated risks. They easily navigate between "two worlds" that are as different as the concrete blocks of a socialist city from the expanses and trails in the taiga. This capacity to switch worlds (settings), which has also been mentioned in the ethnographic literature from the Russian Arctic, enables them to make local knowledge more relevant for industrial development settings.[5][6]

Fieldwork was carried out using a novel interdisciplinary approach, where an anthropologist and a legal scholar together visited the places of planned construction and ongoing industrial development. Past experience has shown that local people are particularly concerned with the regulatory framework for industrial development, and their rights to participate in decision making and implementation, during the project appraisal, planning, formal environmental impact assessment (EIA), and construction phases of industrial projects.[7] Thus, the fieldwork benefited from having a legal specialist and a local livelihood specialist on hand to provide insight into local ways of dealing with risk associated with industry projects.

Following anthropological ethics and local sensitivities, we kept our fieldwork approach consciously inductive. The fieldworkers lived for a limited time in the same places and contexts as their research partners, thus gaining substantial insights into the principles and most pressing questions of local life. This crucial background information significantly informed our thinking and, later, our way of writing. The number of person-days in the field (in this case 45), formal interviews (14 for this research), or direct quotes in the article cannot reflect the foundations on which this data is based. Quantification of such data gained through participant observation rather distorts than emphasizes the evidence gained from fieldwork. Though scientists may find participant observation data problematic, as they believe it lacks transparency and testability by outsiders, such data reveals typical and in-depth principles of local perceptions of risks, priorities, and development.[8]

Insights gained from living with the people crucially informed the way we conducted semi-structured and unstructured interviews with people in South Yakutia in the catchment area of the Power of Siberia pipeline. The interviewees were chosen based on their ability to give us typical and deep insights into every relevant group of local people. For example, when interviewing representatives from two major mining companies in Neryungryi, we chose to speak with those who deal with company social policies and local content. At the municipal government level, we chose to interview employees who are responsible for representing indigenous peoples during industry public hearings. Two inhabitants of the Evenki reindeer herding village of Iengra were chosen, one an activist from the village, and another a herder from the forest employed by the main reindeer herding company. However, leaders and members of indigenous communities (*obschiny*) were most instrumental to our understanding of the local perception of risk and forest dwellers' ideas of companies' and authorities' performance in governing extractive industries development. Finally, we set up a meeting at the North-Eastern Federal University (NEFU) in Yakutsk to discuss the position of the Sakha Republic as steering industrial development and its local impacts.[ii]

[ii] This workshop, entitled "Northern small-numbered indigenous people research through the prism of social and legal anthropology" was organized by Aytalina Ivanova and took place on 23 January 2015.The workshop

Through this combination of interviews, informal conversations, outdoor activities, public meetings, and private gatherings, which often took place in people's kitchens, we gained an understanding of how people representing different sections of the Sakha society participate in the implementation practices of regulatory frameworks designed to manage risks from industrial development.

For the second data source, we utilized an earlier extensive review of all relevant federal and provincial statutes, and regulations promulgated thereunder, co-lead by one of the authors in 2011.[9] This review included laws and regulations on matters involving environmental protection, protection of small-numbered indigenous people,[10][iii] distribution and management of on-shore mineral resources,[11] and development and construction of energy infrastructure.[12] As part of our analysis, we conducted a currency review of all the relevant legislation and administrative regulations by using the Russian legal database Konsultant.[13] We have incorporated all of the changes made since 2011. We gave corporate standards, rules, and policies a cursory review because we determined early in our investigation that these target *specific* impacts and risks that are usually viewed as barriers to project implementation. After the preliminary review, we focused our analysis on the Federal Law "On Environmental Review," the Order of the Committee of the Russian Federation on Protection of the Environment dated as of May 16, 2000, and the Law of Sakha (Yakutia) "On Ethnological Review in the Areas Traditionally Occupied and Utilized by Indigenous Small-numbered People of the Republic Sakha's (Yakutia) North" ("On Ethnological Review").

The third source of our data was a byproduct of the "transparent government" policy aggressively implemented by the Russian leadership. Starting in mid-2000s, many federal agencies and offices started publishing transcripts of official meetings, interviews, and speeches on various government websites. The Administration of the President of the Russian Federation has been notably diligent at documenting activities of Presidents Putin and Medvedev, particularly starting in the second half of 2008. Although it is very likely that not all official conversations and remarks are made available to the public, based on our analysis, these transcripts represent a valuable source of data. As a preliminary step, we searched the official on-line transcript database of the Office of the Russian President for the terms "environment," "energy," "oil and gas", and "risk" (in Russian).[14] We then conducted a manual preliminary review of all returned records dated between November 2008 and March 2015. We selected 99 relevant transcripts for a more in-depth analysis, which we conducted with the use of the Atlas.ti software. We employed discourse and content analysis as complimentary methods.[iv][15]

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included experts from the Commission on the Ethnological Review, scholars, the leader of the union of indigenous communities (obschiny) of South Yakutia, and other indigenous activists.

[iii] It is important to note that under Federal Law "On Guarantees of Indigenous Small-numbered Peoples' Rights," an ethnic group must satisfy the following requirements to be recognized as indigenous small-numbered: (1) reside on traditional ancestral lands; (2) maintain traditional way of life and economic activities; (3) have a population of less than 50 thousand people; and (4) identify themselves as a single ethnic group.[10]

[iv] We did not provide a list of the reviewed transcripts due to the space constraints but we noted all the referenced transcripts in the article.

We begin this article with a brief discussion of the risk experts versus laypeople debate in the context of the energy sector. We maintain that this theoretical debate has led to significant practical implications. We continue with a discussion of one of the key features of energy mega-projects, systemic risks. With a focus on risk governance, we transition into an analysis of the indigenous approach to risk. We contrast this approach to the approach taken under the applicable federal and regional (Sakha) law. We conclude the article by proposing four pathways for integrating valuable elements of the indigenous approach into the current legal and regulatory framework.

II. Risk in the Energy Sector

The "rise of risk" during the last and current centuries as an important factor in energy decision-making appears to be the only aspect of the risk discourse upon which people agree. The opinions of many government officials, corporate executives, academics, and members of civil society diverge on what constitutes risk, how to deal with it, and who should be dealing with it. Below, we elaborate on these points of contention.

One of the authors, while searching for the U.S. Environmental Protection Agency's (EPA) definition of environmental risk, was surprised to find four.[16] Aven and Renn located at least ten common definitions of risk while noting that more definitions exist.[17] The differences begin with what appears to be pure semantics, as the terms "risk," "hazard," and "impact" are frequently used interchangeably. In some cases, it is a matter of a creative author trying to improve the stylistic quality of the work product, and in other cases the preference of one term over another is intentional.[18] The term "hazard," according to the International Risk Governance Council (IRGC), emphasizes the inherent dangerous properties of the risk agent. [19] The term "risk" on the other hand, focuses on potential adverse consequences of a risk agent characterizing them according to their probability and magnitude.[19]

Policy consequences of overlooking this seemingly academic typology are far from trivial. For example, if oil spills are viewed as the primary risk of oil and gas activities, the risk analysis might end at their prevention and containment. Yet the adverse consequences do not end with sea birds, or in the case of a land pipeline rupture, surrounding vegetation covered in oil.[20] During the Deepwater Horizon disaster, the economy of several U.S. states came to a standstill, thereby jeopardizing livelihoods of millions of households. And it was not just the oil and gas sector that experienced a shutdown due to the moratoria imposed on offshore oil and gas activities. The spill impacted Floridians, Alabamians, Louisianans, and Texan of many different occupations and trades ranging from tourist shop owners to helicopter pilots and from fishermen to restaurant employees.[21] Thus, a great deal of *what* adverse consequences are included in the scope of risk analysis stems from the very definition of risk.

Another difference, perhaps the most significant one in understanding of risk, originates in the objective versus subjective risk debate. This debate has been instrumental in determining how risks are handled and who gets to decide how to handle them. Risk "objectivists" insist that one cannot perceive risk because risk is not a tangible thing that people can sense.[22] The "subjectivists" camp argues that as long as humans assess, evaluate, or appraise risks (at any stage and to any degree), the notion of risk cannot be objective.[23] The rise of the objective view critique is frequently associated with Ulrich Beck and his seminal book, *Risk Society: Towards a New Mode*rnity. [24] Other scholars, such as Sjöberg, Boholm, Sandman, and Crawford take a reconciliatory approach that allows for the coexistence of both views.[25][26] The approach taken by Eugene Rosa,

Otwin Renn, and Aaron McCright in "The Risk Society Revisited" is particularly interesting, as the scholars explain this coexistence by recognizing the ontological and epistemological dimensions of states of risk.[2] The approach does not discard a possibility that events and situations occur independently of human perception or cognition while recognizing that as soon as such an event or occurrence is deemed to be of human value, it ceases to be an objective notion.[2]

According to Adams, the "objectivist" camp favors specially trained professionals, "risk experts," to identify, assess, and manage risks while treating them as "the probability of an adverse future event multiplied by its magnitude."[27] The "subjectivist" camp allows for broad participation in risk decision-making by the general population, or as it known in the risk literature, "lay-people."[27] In the West, this division became particularly acute during the 1980s and early 1990s in the aftermath of several significant technological disasters, such as the accident at the Soviet nuclear power plant in Chernobyl, Ukraine in 1986.[2] After the explosion at the Piper Alpha platform off the coast of Scotland in 1988 and the grounding of the Exxon Valdez tanker in 1989, people on both sides of the North Atlantic grew uneasy about the dangers of ostensibly bulletproof energy technologies and started questioning the competence and values of risk experts.[28][29][2]

The public discourse precipitated major advances in risk research in social sciences and popularized scholarly literature on risk among masses. For example, the widespread public anxiety over the Chernobyl accident made Ulrich Beck's aforementioned book a bestseller within six months of its publication, a rare feat for any scholarly work.[2] More importantly, this wave of public concern pushed the two sides of the debate into a dialogue on both the academic and policy levels. Unfortunately, with the high cost of first attempts to handle risk inclusively combined with fading public concern over major technological risks all but nullified many attempts to achieve a consensus. On the policy front, technical risk analysis regained its prominence with experts reining supreme again.

Perhaps there is no better illustration of the "objective" view of dominance of risk experts than the titles of the two legal statutes that we analyze in detail in Section V. Both feature the word "expertiza," which translates from Russian as "expert review." Although both allow for some rather limited input from laypeople, it is the expert that ultimately decides the fate of a project.[v]

The Deepwater Horizon accident on April 20, 2010 that resulted in the largest oil spill in U.S. history rekindled the risk debate within the energy sector.[21] It also caused a worldwide policy, legal, and regulatory response consisting of moratoria, reviews, and changes in the laws and regulations that govern oil and gas activities.[21] Part of this response was the rise of the notion or risk-based regulation premised on the performance-based approach. In fact, the prescriptive model, which is the model that the United States had been almost exclusively relying on prior to the accident, became a subject of criticism. As part of the regulatory response, the United States adopted the Safety and Environmental Management Systems (SEMS) rule that requires, among other things, operational risk analysis. The revised version of the rule, SEMS II, followed putting emphasis on creating safety culture. [30] "Risk based approach" and "risk based regulation" became popular if not required buzzwords at oil and gas events creating a validation point for any regulatory or policy initiative containing the term "risk." [31][32]

[v] See the discussion in Section V.

The Deepwater Horizon disaster and the ensuing regulatory response did not pass unnoticed in Russia. In fact, the Russian leadership, including both President Medvedev and President Putin, remarked on the significance of the oil spill for reforming the Russian legal and regulatory system.[33][34] The latter went as far as to note potentially devastating consequences of such a spill in the Arctic.[34][vi] The former used the accident to build a case for the modernization of the Russian legal and regulatory system including incorporation of the performance-based regulatory model.[35]

With Russia's "oil miracle" that propelled the country from the economic cellar to one of the booming economies of the first decade of the 21st century came foreign technology and capital.[36] Another item that came and is likely to stay is the global energy vernacular. Risk has become a popular term in the official energy discourse in Russia. Our review of the presidential transcripts showed that the term "risk" was mentioned 52 times in relation to various aspects of the energy sector. Risk appears to be a fixture in the vernacular of the current and previous Russian presidents, top government officials, and industry leaders. It has been predominately used to highlight the challenges that oil and gas projects face, such as hydrocarbon price volatility.[37]

The proliferation of the term "risk" in the Russian energy discourse is hardly surprising. First, energy, and oil and gas in particular, lie at the core of the Russian economy. According to the US Energy Information Agency (EIA), oil and gas accounted for 68% of Russia's export and 50% of its budget revenues.[38] Although these numbers are lower than that of Nigeria or Venezuela, the qualitative penetration of the oil and gas sector into all phases of the Russian economy and society suggests all-around dependence on hydrocarbon production.[39][40] In addition, Russia has been and for the foreseeable future will remain an integral part of the global energy sector. It is the largest natural gas and second largest oil exporter in the world.[41] Unlike during Soviet times, Russian energy companies are forced to speak the language of the global energy sector. And, as highlighted above, this language has "risk" as an operative term.

III. Risks and Energy Megaprojects

During the meeting of the Presidential Commission on the Strategic Development of the Fuel and Energy Sector and Environmental Security (the "Presidential Energy Commission") that took place on 4 June 2014, President Putin referred to the natural gas sector as *sistemoobrazuyuschaya otrasl* (system-forming sector).[42] He clarified that because natural gas is used as fuel and feedstock for manufacturing a wide range of products, it is an important factor for "the socio-economic development of the country."[42] It is hard to disagree with the Russian leader – in addition to providing feedstock and fuel, natural gas is a significant source of export revenue.[43] Thus, adverse impacts associated with the sector's activities will not stop within its boundaries; they will affect the entire system that it forms.

In this respect, the Russian leadership has a lot to worry about. In addition to the energy sector being the heart and the soul of the Russian economy, it is highly concentrated in terms of the size of its projects, as well as the infrastructure and companies that make these projects possible. The future of the Russian energy sector appears even more concentrated and centralized as Russian

[vi] It is important to note that President Putin made his remarks in connection with the protest by Greenpeace during which the organization members attempted to board the Prirazlomnaya platform in the Pechora Sea.

policy makers are set on exploiting and delivering the country's vast mineral resources via large-scale projects, including several new projects in the Russian Artic and sub-Arctic.[vii]

Van de Graaf and Sovacool define international mega projects as those that span over at least three countries and have over one billion US dollars in capital expenditures.[44] One does not need to engage in sophisticated economic analysis to see that most if not all projects that the U.S. Energy Information Administration noted in the country brief qualify at the very least as national "megaprojects."[viii] This is certainly true regarding Russia's oil and gas undertakings in the Arctic and sub-Arctic where, aside from smaller developments located on the margins of mature fields, every project appears to come with a "mega" designation. For example, the Yamal LNG, an international project spearheaded by Novatek, was estimated as of the end of 2013 to require U.S. $26.9 billion in capital expenditures.[45] The estimated capital expenditures for the infamous Prirazlomnoe project are U.S. $5.7 billion, and this figure does not include the costs incurred from the original prospecting through field discovery in 1989 through 2002.[ix] The figures quoted by the Russian leadership for the development of the three South Kara Sea license areas are truly astronomical. President Putin has referred to estimates of as much as U.S. $500 billion to fully develop these resources.[46]

The list of Russian energy projects would not be complete without the ambitiously named natural gas transmission system "Power of Siberia" used as a case study in this paper. The Power of Siberia has the potential to become one of the largest undertakings in the history of oil and gas transportation in Russia. The pipeline will tap into the Kovyktinskoe field in the Irkutsk Region with natural gas reserves of 1.5 tcm (24 tcf) and the Chayandinskoe field in the Sakha Republic with natural gas reserves of 1.2 tcm (19 tcf). Once the pipeline becomes operational, it will transport the Kovykniskoe and Chayandinskoe natural gas resources to China for 30 years at the rate of 38 bcm.[3] The Power of Siberia will span approximately 4,000 kilometers and will have an annual capacity of 61 bcm. It is estimated that the project will cost the contracting parties, Gazprom and China National Petroleum Corporation (CNPC), $70 billion, with the Russian side responsible for $55 billion and the Chinese side for $15 billion of total project costs.[47]

As Van de Graaf and Sovacool note, massive energy infrastructure comes with economic, social, and environmental risks that are often so insurmountable that a megaproject, despite significant expenditures, never moves beyond the planning stage.[44] We argue that such risks belong to the systemic category. However, not all risks in connection with energy megaprojects are of the systemic kind. In fact, as we elaborate in Section V, the risks considered during the environmental

[vii] In addition to new energy projects, expansion of several existing projects, such as trunk oil and gas pipelines, are either carried out or planned for the immediate future.[38]

[viii] Because oil is a globally-traded commodity, an argument can be made that all oil development projects over one billion US dollars should fall under the Van de Graaf and Sovacool's definition of an international megaproject. A similar argument can be made in relation to LNG projects that reach three or more countries.

[ix] There are further uncertainties in addition to more than generous support from the Russian government that are likely push the capex figure well above the reported US $5.7 billion.[45]

review of the Power of Siberia are less likely to have the effect of the risks arising out of the natural gas transmission system as a whole, which were not within the scope of our review.

The essence of systemic risk is captured in the following simple but encompassing definition from Kaufman and Scott: "the risk of or probability of breakdowns in an entire system, as opposed to breakdowns in individual parts or components, and is evidenced by co-movements (correlation) among most or all parts."[4849] The IRGC describes systemic risk as "embedded in the larger context of societal, financial and economic consequences and is at the intersection between natural events, economic, social and technological developments and policy-driven actions."[50]

Klinke and Renn identify the following main characteristics of systemic risks: (1) complexity, (2) uncertainty, (3) ambiguity, and (4) ripple effects.[51] Complexity refers to challenges of "pairing" the multitude of adverse consequences with potentially affected parties, as well as untangling the casual connections and determining the feedback loops. Uncertainty refers to the evidentiary shortcomings clouding the cause and effect links. Ambiguity allows for several legitimate interpretations of the same data set. Lastly, "ripple effects" include secondary impacts separated by spatial and temporal gaps from the primary ones and extending into social, economic, and political dimensions.[51]

The Power of Siberia has the make-up to be one of the largest sources of systemic risks in the history of the Russian oil and gas sector. As we show below, the risks associated with its construction and operation are complex, uncertain, ambiguous, and capable of causing sizable ripple effects. In addition, they have the potential to result in severe environmental, social, economic, and political consequences and impact the entire national economic system.

The Power of Siberia is too *complex* an undertaking to accurately estimate its social and economic effect. Shortly after the agreement between Gazprom and CNPC was officially announced, some commentators raised concerns about the project's socioeconomic and geopolitical viability. For example, Morgan Stanley analysts thought so little of the agreement's economic potential that they downgraded Gazprom's stock "to reflect the signing of the deal with China."[52] Despite President Putin's personal blessing of the project at a ceremony commemorating the start of construction on September 1, 2014, the project has been marred by many setbacks.[3] Initially, May 2019 was announced as the month in which Gazprom was supposed to commence deliveries to China. At the time this article was written, the projected deadline was extended by two years, raising further concerns about cost overruns due to the delayed deliveries of natural gas. In addition, according to some reports, the Chinese side froze financing of the project. [53] This prompted some analysts to suggest that the Power of Siberia, despite years of negotiations, exploration, and preconstruction, might never become a reality.[53]

The high stakes of this project, the geopolitical outcome of a failure to execute it is *uncertain*. The Russian leadership presented the Power of Siberia as the first step to diversify its natural gas export markets away from the European Union. The announcement of the CNPC-Gazprom deal came at a time when many wondered how Russia would handle the cooling of its relationship with a strategic energy-trading partner. Whereas the deal announcement scored the Kremlin many public relations points, an end of this undertaking will likely take most if not all of these points away.[54]

The Power of Siberia's future is clad in *ambiguity*. On the one hand, it could be seen as a stable and long-term contractual relationship that is projected to serve as the economic basis for the development of a region that occupies 60 percent of Russia's territory but is occupied by only 10 percent of its population.[55] On the other hand, it is a mammoth system with downstream and midstream components that currently relies on a single market, China. Two-thirds of the transmission system's capacity is dedicated to the deliveries pursuant to the CNPC–Gazprom deal. However, unless the construction phase under the agreement is performed in full, Gazprom's ambitions regarding the remaining one-third of the transmission capacity, domestic use or diversification of additional exports, will not come to fruition.

A halt in the midst of the project's construction or operation phases will certainly send sizable *ripples* throughout the East Siberia and Far East regions of Russia. Unpaid salaries and forced relocations, displaced subsistence economies and closing small businesses, and marginalization and eventually eradication of indigenous cultures and livelihoods will be among the socio-economic impacts associated with the potential failure. Abandoned and mishandled equipment, undisposed hazardous materials, as well as forest and tundra landscape stripped of vegetation in preparation for roads and supporting infrastructure, will create multiple sources for environmental risks.

IV. Local Approach to Handling Risk

Governing systemic risks

Systemic risks, including risk arising in connection of energy mega-project akin to the Power of Siberia, provide a particular set of challenges. The conventional risk analysis, which consists of risk assessment, risk management, and risk communication, lacks the capacity for taking a broad view of potential risks, incorporating multiple qualitatively divergent data points, as well as establishing causal ties and connections expressed often by different groups of risk experts. More importantly the conventional risk analysis lacks the capacity for reconciling such differences in a transparent, socially and politically acceptable manner.[2]

In the mid-1990s an integration of analysis and deliberation emerged as a plausible platform for handling systemic risks. [21950] This precipitated the advent of a more refined model for handling systemic risks: risk governance.[56] Risk governance is based on the notion of collective decision-making drawing on the participation of a mixture of private and state actors acting pursuant to formal and informal rules.[2] It fuses the traditional risk analysis with collective decision-making. As a result, risk analysis becomes a part of the applicable political, administrative, corporate, and legislative processes, benefiting from the additional controls and safeguards built into them while also suffering from their shortcomings. Although we can argue about the overall societal value of risk governance vis-à-vis traditional risk analysis, one thing is certain – risk governance ostensibly challenges the hegemony of risk experts. It does so by adding actors who can openly question and sometimes overrule experts on non-scientific, ethical, political, and legal grounds.

The framework of risk governance introduced by IRGC adds two more phases, pre-assessment and characterization/evaluation.[50] Thus, the risk governance process consists of the following five steps: pre-assessment, appraisal (scientific risk assessment and concern assessment),

characterization and evaluation, management, and communication.[19] The first four phases are sequential and the fifth, risk communication, is meant to serve as an internal and external bridge. The IRGC framework is encompassing, holistic, and flexible, especially considering that it is designed to conceptualize a relatively young concept. It is also an evolving framework, which is evident from the IRGC work as well as the work of risk governance scholars. Klinke and Renn, for example, recognized the excessive rigidity of the IRGC's framework and offered a more flexible approach. Their model allows for more adaptation to the risk at hand, as well as for more integration with available capacities to handle the risks.[57]

Notwithstanding the differences, both frameworks feature the epistemic and socio-political aspects. The epistemic aspect focuses on knowledge acquisition, and the socio-political aspect is centered on collective decision-making. Thus, both frameworks do not dwell on the differences in the objective and subjective views of risk. More importantly for the purposes of this article, the epistemic aspect of risk governance under both frameworks is not limited to labs, supercomputers, and statistical averages. Therefore, at least in terms of identifying risks, knowledge can come from a plethora of sources, including those labeled by risk experts as unjustified fears of citizenry.

Some of these fears may mean little to a private industrial actor. After all, oil and gas companies, as well as the numerous members of their supply chains, are generally not responsible for the assessment of indirect impacts of industrial development. Such impacts include, for example, decrease in the capacity of the local subsistence economy and thus resilience to the economic ups and downs associated with commodity-based economic development. Governments, on the other hand, as insurers of last resort, *are* responsible for an isolated community that is left without sufficient hunting grounds or reindeer pastures, and thus sufficient means to survive a long and brutal winter. Unfortunately, governments often fail not only at recognizing their responsibility to take such risks into account but also dealing with the adverse consequences when they materialize.[58]

There have been previous studies on attempts to integrate traditional knowledge into decision-making and governance of industry projects, and management in general. There is little literature on this topic with a Russian indigenous focus,[59] though this is a very advanced field in the North American Arctic.[60] There, this integration is in many cases around the topic of co-management of resources.[61][62][63] This is particularly true for environmental impact assessment, which is an obvious starting point, as it is widely assumed that indigenous knowledge is "TEK", meaning it is about the natural environment.[64] Stevenson highlighted twenty years ago that this is too narrow an assumption, because indigenous knowledge is not only about the environment, but also about a holistic system. Indeed, the strength of that knowledge is in its interconnectedness as a complex system, where changes in any one factor influence others. Knowing these interconnections is of tremendous value, certainly for purposes of risk governance.

One reason why this linking of local ways of knowing and governing systemic risks may not have been attempted explicitly thus far may lie in the incompatibility of what Nadasdy has called the managerial approach.[63] The managerial approach is based on a worldview where the environment's only value is as a storehouse for capitalist resource extraction, even when such extraction is termed sustainable. Nadasdy has also explained how the success stories of co-management actually fail to produce that real integration that Stevenson identified in 1996 as key for success in incorporating indigenous knowledge into EIAs. The reason is systemic – that engaging in such efforts for local

people may alienate them from the worldview that they actually need to *live* in order to enact their ways of knowing their environment. Stammler and Ivanova have argued that, especially in the Russian context, it is illusionary to aim for an eye-to-eye integration, which will just lead to defeat of the indigenous worldview.[65] Rather, pragmatic solutions that satisfy companies, indigenous peoples, and authorities can be found in particular situations where the indigenous partners accept a niche that is granted to them by the dominant extractivist managerial system, as we have shown with the Nenets Autonomous Okrug.

Nadasdy calls for a re-evaluation of co-management agreements on political terms,[62] which is echoed by O'Faircheallaigh's finding that theory on indigenous people and extractive industries underplays the capacity of the former to exploit certain political configurations[66]. The implications of this finding are foremost regional, as O'Faircheallaigh argues. This echoes what we have found in Yakutia, where the opportunities for indigenous agency to influence the ways in which extractive industries impact people are on the local and regional levels more so than on the national (Russian Federal) level. Ingold and Kurttila (emphasize that this way of knowing must be understood "as generated in the practice of locality."[67]

In the Western Arctic, the literature on integrating indigenous ways of knowing revolves around the concept of co-management and participation. In Russia, then, the corresponding instrument around which this revolves is the ethnological review (ER). ER is a process of impact assessment on culture and society of those indigenous and local people who use the land in a traditional way and will be affected by industrial development. Murashko highlighted the potential for partnerships between anthropologists and indigenous local residents in carrying out such a review,[68] and actively carried out such projects, for example among the European Nenets jointly with their indigenous association.[69][70]

Novikova regularly carries out such reviews by order of the industrial companies.[71] Such reviews consider local and indigenous ways of knowing through the anthropologist's fieldwork data. Moreover indigenous politicians have an influence on the research design, and its results, through their membership in the commission that accepts the review. Subsequently, these indigenous politicians can also become coauthors of any written product that comes out of such reviews.[72] While Novikova has practically established an entire field in Russia for the legal anthropological expertise required for such reviews, there is not yet literature on how such incorporation of local indigenous knowledge would work if it were legally required.[73] All the above-mentioned works are based on voluntary action, and commissioning of such reviews by companies, authorities or indigenous peoples Associations themselves. Only since 2010 is there a law in Russia that makes this kind of review mandatory.[7]

Local ways of handling risk in East Siberia

Not all fears about risks are alike. As we argue below, the way of handling risk that we observed during our fieldwork provides not only a valuable contribution to risk identification during the initial (pre-assessment or pre-estimation) phase of risk governance, it can serve as a model for risk identification and evaluation in energy megaprojects.[57] It also has further potential to be considered during risk management as energy projects are being implemented. For the purposes of this article, we referred to this way of dealing with risk as "local." This designation applies to all indigenous people as well as others who live close to the natural environment and use it in a way specified in the Law "On Guarantees of Indigenous Small-numbered Peoples' Rights"

The people and their livelihood amidst industry have been subject to previous study, most notably due to their previous experience with the ESPO pipeline construction. The works by Yakovleva provide excellent complementary evidence for the framework presented here. [74] [75] [76] [77] However, they do not have a risk orientation. They focus more on the relevant federal legislation and how this legislation lack implementation on the ground, analyzing implications for the people more as passive objects of rights and duties, rather than as agents in risk governance. Yakovleva's most recent chapter provides important insights from local people, including the village of Khatystyr in Aldan district, on the impact of pipeline construction.[77] However, it does not consider the changes in the legal and regulatory framework since 2010, when Russia's first law on ethnological review was adopted in the Sakha Republic and made local participation in impact assessment mandatory.[78] The drafting and adoption process of this law itself can be seen as one local approach to governing systemic risks.[7]

Sirina and Fondahl's paper employs the term of risk and people's perception thereof, but does not use a risk-theory frame. Instead, it focuses on the concerns about the disconnect between *de jure* indigenous rights and the realities of marginalization on the ground if the pipeline were to run through their hunting grounds in the neighboring region, Zabaikalye.[79] Both Yakovleva and Fondahl and Sirina restrict their analysis to Evenki only, while Ivanova's article illustrates the legal inconsistencies that surrounded the pipeline's construction through Yakutia, where the lack of regional legislation for cultural social impact assessment was identified, a point that was later repeated by Yakovleva.[80] [75] [76] [77] [79] These works form important starting points and give rise to the question of how lessons from such past experience like the ESPO pipeline are now being considered in the region. In particular, we shall explore in greater detail how regional regulatory documents in place, such as the Sakha Law on ethnological review, reflect the risks perceived by people on the ground.

These people do not perceive the risk in the conventional meaning of the term; they *live* in and with it. The process of everyday living marks their key expertise. The day-to-day engagement draws upon the ancestral experience spanning multiple generations. But this experience is being enacted by everyday challenges and processes. This process-oriented approach is also what some of the existing literature on TEK and indigenous knowledge integration has highlighted.[67] [85] When this way of knowing is "compared" to scientific knowledge, or put into databases, or "tapped into," this way of knowing loses its context and thus also its explanatory potential for addressing systemic risk governance in the industry. The scholarly community is divided between those who see this challenge as insurmountable[81][82], and those who argue for being aware of it and using appropriate toolkits for realizing its potential. [83]

This is hardly the heuristics that the "expert" side of the risk debate often criticizes.[84] It is not based on individual experiences over one's lifetime. Rather, it is premised on individual experience collected over centuries, therefore providing an extensive set of historically embedded wisdom. It resembles a sophisticated simulation that is run tens of thousands and even a hundred-thousand times. Every time it is run, it experiences an additional layer of detail and sophistication due to the individual and collective practice by human agents on the land. Therefore, we caution against too simplistic use of what has been called "traditional knowledge" as "data" that can be put into databases just like figures.[85] Moreover, the costs of misrecognition, mis-assessment, and mismanagement are measured in individual lives, families, and whole communities.

This is not to say that indigenous expertise cannot be valuable for the conventional risk analysis. Given the fact that no group of actors has deeper experience and knowledge of the land under which the resources are located, or on which the pipeline runs, risks identified and managed by the forest-dwellers in the context of subsistence economy may also matter for industrial planning. It was a common occurrence during our recent fieldwork in Yakutia, as well as during our previous expeditions in the region to encounter indigenous peoples scratching heads over some questionable decisions made by developers. For example, why would one want to build a pipeline in an area where hunters have known for generations that the ground is especially unstable due to frequent thawing and freezing cycles on discontinuous permafrost? Or would it not cause unnecessary trouble to build a container settlement for fly-in / fly-out workers on the site of a graveyard, one that is in addition to that also infected with anthrax bacteria that stay in the ground for many generations? Or can industrialisers really be sure that the warnings by indigenous practitioners that sacred sites such as shamans' graves must remain intact and untouched by industrial development, otherwise the spirits may get angry - are all empty suspicions? Even in the atheist Soviet Union many geologists and oilmen, some of whom had extensive scientific background stayed away from such sites for ostensibly unscientific reasons. In cases where they do not stay away – often the indigenous people see the consequences in disasters that happen as a result of such disrespect. During the exploration of the Bovanenkovo gas field for example, a drill rig caught fire when it was put on a place close to a sacred site of the Nenets reindeer nomads, while another one fell into a lake which had been identified by the nomads as host of water spirits responsible for fish resources of the area.[86x]

Therefore, indigenous people's "data" regarding their land could be useful not only for consideration at the early planning stages of industrial development, it could also potentially save human life, and thus has potential for risk management before and during industrial project implementation. However, as we argue below, it is not the indigenous "data" but rather the indigenous way of approaching risks in connection with their land that represents the utmost value for risk governance of energy mega projects. It is this difference between scientific knowledge and indigenous ways of knowing, between static replicable non-contextual "data" and contextual process that also makes it so difficult to integrate the two worldviews in impact assessment.[83] [82] The indigenous way is largely phenomenological, as we outline in the next section, hence allowing for the inclusion of other (than pure epistemological) aspects in the decision-making process. [i] It is important to note that the principal reason for noting other aspects (e.g. ethical) is to highlight the encompassing nature of the phenomenological approach, allowing for the coexistence of epistemic and ethical dimensions side by side. It does not focus exclusively on the "system" side of things while leaving "lifeworld" at home. After all, for an indigenous forest dweller, his home is also the home of the economic system of which she is an integral part. In addition to reliance on having a holistic picture, the indigenous way of approaching risks does not have an "expiration date." It employs the perpetual or near perpetual temporal continuity of experience and practice.

[x] This point is beautifully illustrated in the film "Zloy Dukh Yambuya" when desperate geologists in the end rely on an old Evenki hunter to help them explain the disappearance of their colleague in the mountains. Buneev, Boris (director) 1977. Zloy Dukh Yambuya (after a book by G.A. Fedoseev).

Holistic picture

To describe the unity of what Habermas identified as "lifeworld" and "systems"[2] that indigenous people living on the land preserved, many anthropologists use all-embracing terms "human-agent in the environment",[87] a "larger worldview that influences how people perceive and define reality"[64], "sentient ecology"[88], or "partnership approach".[7] These terms are grounded in a phenomenological approach that emphasizes the importance of continued human practice for the perception of the environment and consequently also the risks from engaging with that environment. Local hunters, herders, and fishermen, including our fieldwork partners in the catchment area of the Power of Siberia pipeline, experience their environment through interaction with its other beings or objects. That interaction always has a certain intention, and thus the experience is directed as experience of some other subject or object. This lies at the heart of phenomenology and[89] intentionality influences what kind of affordance the human agent perceives of the environment through practice with other objects or beings in that environment. [xi] [90] [85] Correspondingly, her intentionality makes her see those affordances that are most useful for sustaining a particular livelihood. We shall illustrate this phenomenological experience of local people with condensed insights from fieldwork.

The local hunter or herder sees in the forest the affordance of a homeland, and feeding and migration grounds for those wild animals for which he hunts. Most likely, that forest is for him also inhabited by spirits that govern the animals and plants of that forest.

In contrast, the pipeline builder sees in the forest the affordance of an obstacle for the route of the pipe, and looks for the best routes to be cleared of vegetation. Thereafter he may see the affordance of the cut timber as a pool of construction material and heating fuel. The difference between the indigenous and industrialist's affordances of the forest is that in the former affordance the forest is important as a live resource, as a host for practice, whereas in the latter case, the forest becomes important as a dead resource.

The meeting of these two meanings of the forest may collide when – as in our fieldwork in Neryungryi and Khatystyr – the forest dweller is engaged in clear-cutting the forest for the company that is subcontracted by the Power of Siberia pipeline. The Grigorievy from the Bugat community had opted for this. They had to see the affordance of the forest as a straight pipeline corridor, in contrast to their own worldview of the forest as hunting ground crisscrossed by trails of animals, trap lines, and walkable human pathways. While they were not talking with enthusiasm about this, they did so clearly with the idea of agency. Rather than being passive victims of development, they wanted to be participants. They also requested to have education of their children paid for by the company as a condition in the agreement between the community and the company.[91]

Hunters like the Grigorievy see walkability along trails that they co-use with the animals. These trails give them moral entitlements to their forest, as they take and give resources from and to the forest. The pipeline cuts their animals' and their own paths of movement. For the oil and gas workers, the pipeline enables movement (in this case, natural gas to China), while for the locals the

[xi] The term from Gibson (1976) was introduced to anthropology by Tim Ingold in1992.

pipeline is like a road block, making part of their forest inaccessible.[92][xii] The trails for movement of local animals and people circumvent areas where the permafrost is too discontinuous and turns the ground into bogs, while other seasonal movement of the ground is accommodated by these trails. The pipeline builder is concerned, as is the hunter, with the support that the ground can give in different seasons for transport corridors. Melting spots of permafrost and moving ground are potentially dangerous for pipeline corridors, as are sudden temperature differences, as the pipes have limited material tolerance and need to be especially prepared before the joints are welded and then sunk in the ground or on foundations. For the properties of the land desired by the pipeline builder, the way of knowing the land of the hunter can be extremely helpful. "[Y]ou have to feel the different temperature regimes of the pipeline, during the day and night time. The pipe "jumps" expands and contracts. The tube got warmer during the daytime, and lies on the foundation a bit elevated, and then in the evening, it evens out, and that's the moment when you need to weld the connection. Good welders know their timing in those conditions." [93] This quote from the field by a Gazprom pipeline builder shows how also industrial workers could start "feeling" the land, resulting in a safer and more efficient pipeline design and construction.

However, this is different from incorporating local epistemologies into the process of industrial decision-making. Such incorporation only marginally improves identification and evaluation of systemic risks associated with energy megaprojects. The main risk identified by indigenous forest dwellers is that they get deprived of their main source of livelihood – the environment that they know and of which they feel part. For this reason, they feel a stewardship kind of responsibility for this environment – they need it in a clean state that they know in order to work for their living, mostly as hunters, fishers, and reindeer herders. The inhabitants of the forest, as well the industry, perceive this risk to be of an environmental kind. However, it is clearer for the former than for the latter that an environmental risk is not limited to the state of the physical environment. Any interference with the environment has social and cultural consequences.

The view of risk is therefore a holistic one, as indigenous forest dwellers do not separate between nature and culture, between humans, animals and the environment that all beings share. For a pipeline builder, the view of risk is limited to the risks *to* the project. The developer does not need to think about the overall impact of the billions of cubic meters of gas moving through the pipeline including the adverse impacts of the commodity-centric economic development and environmental impacts at the point of extraction and consumption. It does not need to consider the possibility of a regulatory capture of the local government by the developer or virtually any impact on the local and regional socio-political life. It is therefore hard for an indigenous mind to understand how the industry and the regional authorities can isolate environmental problems during, for example an environmental assessment process and not simultaneously consider the social and cultural implications associated with the environmental issues under review.

As the results of our fieldwork in Sakha showed, unlike developers, indigenous people on the land do not focus on individual activities or projects. For them it does not matter which company or project actually interferes with their lives. They have on the one hand the bigger picture, thinking in terms of their movement on their land, together with all other beings on that land, formed by their intentional experience as agents in their environment. They have on the other hand a hard time keeping track of all the different subcontractors, sometimes not even knowing for which big project

[xii] This view is not specific to our own fieldwork only. Other colleagues report similar setups from their field.[92]

they work, and to whom they should talk. Correspondingly, one of the greatest risks identified by indigenous people is the loss of information about factors impacting their land. This sometimes becomes so overwhelming that people feel completely powerless in the face of industrial development. Some simply stay in the forest and become invisible to the formal processes associated with the development. In the most unfortunate of all possible outcomes, some choose to take their own lives if they feel trapped in the maze of industrial development.

We are familiar with such instances of suicide in Yamal. It would be hard for some to picture such a "maze" on what is commonly regarded as the "middle of nowhere." However, large industrial projects are hardly a rarity, especially for those indigenous groups that rely on the movement over vast space for subsistence. For example, the following industrial projects are located on the territory of Bugat obschina: (1) the Timir iron ore mine and processing facility; (2) the Kankunskaya hydro power station (under construction); (3) the Kankunskaya – Neryungri high voltage transmission line (under construction); (4) the Maly Nimnyr – Kankunskaya hydro power station motorway (under construction); and (5) the Power of Siberia pipeline. Aytalina Grigorieva from the Bugat community illustrates sadly how her people experience each and every project on their land, not as separate entities, but as layers one on top of the other. This impressively shows how their bigger picture of industry is composed as layers of individual and detailed experiential vistas on their land. For example, the experience of the Power of Siberia construction agreement is composed of experiencing the negotiations of quarry construction, of electric line construction, of forest clear-cuttings, or road construction, and other activities, each of which is carried out by different incoming agents on the community's land. While each of the industrial agents sees themselves as independent and separate from the rest, the Grigorievy from the Bugat community see all of them as small layers of the big industrial change that comes to their land.[94]

The holistic approach does not separate analysis from deliberation. Living in and with risk effectively means that memory, skill, and learning are utilized in the context of everyday collective decision-making, subject to often instant or near instant accountability. The difference between forest dwellers and industrial ways of handling risks is visible when people feel abandoned by the officials that they elected, as the officials become more and more integrated into the state bureaucracy. [xiii] This became especially clear, for example, when talking to the local bureaucrat in Aldan who was responsible for the public hearings that took place in connection with the Power of Siberia pipeline. While all the legal protocols were followed and all of the hearings archived, he had for some reason not even invited a clan-community (*obschina*) representative to the organizing commission of the hearings. Asked about the reason, he replied that the hearings were for the construction of sand quarries for the pipeline, and on those projected sites there was no indigenous community activity, so the quarries would be irrelevant for them (structured interview, Palamutov, Aldan, 31.01. 2015).

The problem lies in the fact that indigenous- or local-activists-turned-politicians have to subscribe to the state political system, and therefore are forced to think in the same electoral terms. That identity becomes more important during their political tenure than their identity as practitioners on the land. Sometimes this brings them in disagreement with their own relatives on the land –

[xiii] This situation has been beautifully but sadly described by Nadasdy in "Hunters and Bureaucrats."[61]

unless they make sure that those relatives benefit from the political involvement of their kin thereby becoming part of the state political system.

Temporal continuity

Another important feature of the indigenous way of handling risk is temporal continuity of their practice and experience on the land. This does not mean that all risks last forever. The temporal continuity amounts to the continuity of responsibility over risks. Simply put, the responsibility to handle risks and educate the successors on how handle them is not restricted by an insurance policy term or liability limit. It is not limited by a public official's tenure. It entails acting as the insurer of the last resort in perpetuity with little individual capacity to "get out."

The perception of time and space among indigenous northerners is part of their specific culturally embedded practice on the land[95]. There is a clear awareness among them that the extractive industry presence in the Russian Arctic and sub-Arctic is a rather short intermezzo in the long history of human habitation on the land. However, this short intermezzo – if it lasts 50 or 100 years – can have long-term consequences for local indigenous people.

The main risk identified by indigenous people is the viability of a forest life for future generations. There is a profound concern that if the hunting, fishing, and herding grounds are depleted or made unusable by industry, the people who know life in the forest today will not be able to transmit their way of perceiving and knowing the environment to their children and grandchildren. This is especially critical for societies like the Evenki where learning does not take place in school but while doing and practicing, In the forest, two generations of interrupted practice on the land can have a detrimental effect on this Arctic and sub-Arctic society long after the natural gas fields are depleted and "the blue fuel" stops making its way southeast.

The results of our fieldwork showed that as a general rule, a politician or administrator thinks in four- to twelve-year election terms; a pipeline developer thinks in 30- to 40-year-long infrastructure lifecycles that are further separated by phases of project development and operation; and a hunter or herder thinks in terms of rolling generations of sustainable livelihood on the land. As our quote above shows, as does other field conversations, local and indigenous people see not only their own life, but also industry in longer time cycles. Martynov from Khatastyr immediately connected industry to his ancestors search for gold with geologists riding reindeer. However, we have also witnessed exceptions, where indigenous inhabitants are ready to sacrifice longer-term stability for shorter-term economic benefits promised by industrial development, or hunters overhunting their prey to cash out on the sudden demand for fur or game meat. We have also met very careful and responsible industrial developers, like Valentin Ivanov (see quote above), who have developed close relationship with the land and would rather be deliberate and inclusive in implementing ambitious projects such as pipelines.[xiv96]

The temporal continuity practiced by indigenous communities and the much shorter-term commitment employed by some industrial actors have a notable substantive distinction. Whereas the latter concentrate on the impacts during the project duration and the most responsible of the lot include impacts after the project is over, the former look at the project as part of the continuous

[xiv] Bolotova's article relies on similar fieldwork and contains some more such evidence on the closeness of some industrial developers with the land in the Arctic.[96]

process of living on the land. Thus, an industrial project might end an indigenous person's life as she knows it if the disruption caused by the project interrupts the practice that she and her ancestors sustained for generations. Unlike the industrial actor, she will not be able to move on to another project, location, or another country. Her land, herd, hunting and fishing grounds, and everything surrounding them is all she knows and all she built her life around.

V. Risk Governance of the Energy Sector under the Applicable Legal and Regulatory Framework

As mentioned above, governance involves collective decision-making pursuant to formal and informal rules. Although it is conceivable to envisage scenarios featuring risk governance without government and thus formal rules, it is virtually impossible to imagine how governance of systemic risks will not rely, at least to some degree, on formal rules. "First, government, represented by politicians and/or regulators is usually an integral part of systemic risk governance and government usually acts pursuant to formal rules. Second, even if for some reason government is not present or if its representatives do not act pursuant to formal rules, formal rules serve as the fallback governance structure if an involved stakeholder group is dissatisfied by the deliberation and/or analysis governed by informal rules. For example, a stakeholder group (an environmental NGO or an indigenous community) challenge a risk governance process based on a company's corporate social responsibility (CSR) program in a domestic or international tribunal. Third, a systemic risk governance framework premised on informal rules still needs to comply with the formal requirements set forth by the national legal and regulatory regime. For example, parties cannot opt out of an environmental assessment if law requires it.

The question of which formal rules, and thus, which part of a legal and regulatory regime applies to risk governance remains to be explored sufficiently. Legal scholarship on risk has focused heavily on the rules for traditional risk assessment.[97] A few authors who explored broader legal issues related to risk converged on the epistemological aspect of risk governance, while paying little attention to the socio-political context in which risk is analyzed. For example, Sunstein in *Laws of Fear: Beyond the Precautionary Principle* made a compelling case against strict implementation of the precautionary principle.[98] However, he did not fully acknowledge the importance of inclusive deliberation for societal risk acceptance, as well as the ethical foundation of distribution of risks and benefits.

Because of the risk characteristics of energy mega-projects noted above, the risk governance process must commence at the level and point of time when the decision *whether* to proceed with a project or activity is made. For example, before deciding whether to open new areas of the Norwegian continental shelf for petroleum activities, the Norwegian parliament must conduct a public consultation. As a result, stakeholder groups have an opportunity further comment on economic, social, and environmental impacts of the proposed development under two strategic environmental assessment (SEA) and one site-specific environmental assessment frameworks.[xv97]

As we elaborate in the remainder of the chapter, Russia lacks similar institutional capacity for systemic risk governance, especially for trunk pipeline systems. Public consultation is not required

[xv] It is important to note that we provide this example to highlight the capacity for systemic risk governance that exists under the Norwegian legal and regulatory regime.[97]

at the policy-making stage. When public input is solicited, its purpose and impact are difficult to trace.[97] The only national-level legal mechanism for bringing deliberation into risk analysis that we identified is environmental assessment. Because part of the pipeline's route will traverse the Sakha Republic, it is subject to the provincial ethnological review law providing an additional opportunity for deliberation that centers on indigenous issues.

The Federal Law "On Environmental Review" sets forth the process of *ekologicheskaya ekspertiza* that amounts to environmental assessment. The process consists of the following two steps: (1) preparation and conducting of an environmental impact assessment (EIA) or *otsenka vozdeystviya na okruzhaiyschuiy sredu* (OVOS); and (2) official government review and certification of the EIA, state environmental review (SER).[xvi] Although the Law on "On Environmental Review" provides some capacity for deliberation and inclusiveness via public participation, this capacity is restricted by the scope of the statute, as well as little practical effect of that the public participation has on the decision-making process.

The principal objective of the statute is the prevention of negative environmental impacts.[99] This effectively means that other impacts, socio-economic impacts, for example, are not within the scope of the statute. We do not intend this statement to be criticism of "On Environmental Review." After all, it is uncommon for environmental assessment laws to extend into the socio-economic realm. Rather, our criticism applies to the rest of the Russian legal and regulatory regime that lacks the capacity provide due assessment to such impacts.

Moreover, the scope of "On Environmental Review" was further restricted by multiple amendments to the statute since its enactment in 1995. According to the former Moscow mayor Yuri Luzhkov, about 5 per cent of the activities within the original scope of the statute were remaining in 2010.[100] For the purposes of this article, the most significant amendment came in light of the enactment of the federal City Building Code on 18 December 2006. Pursuant to these amendments, trunk pipelines were taken out of the purview of the law "On Environmental Review." Only the pipelines located offshore and the pipelines traversing highly protected environmentally sensitive areas were remained within the scope. Instead of environmental review, trunk pipelines became subject to a state expert review under the City Building Code that boils down to a review of project plans and technical drawings.[101]

Thus, it should not come as a surprise that the Power of Siberia project as a whole never underwent an environmental review. Instead, only several units of the supporting infrastructure having secondary bearing on the successful operation of the pipeline remained subject to mandatory environmental assessment. At the time this article was written, seven waste disposal sites near compressor (pumping) stations were undergoing SER.[102]

As mentioned above, the first phase of environmental assessment under Russian law is OVOS, which is conducted by the proponent of the activity. Pursuant to the 16 May 2000 Order of the Committee of the Russian Federation on Protection of the Environment (Order 372), the processes commences with the proponent of the activity submitting a notice to government authorities with preliminary information about the planned activity and OVOS including the so-called *tekhnicheskoe*

[xvi] We retained the Russian acronym (OVOS) for the first step of the process and the English acronym (SER) for the second step to avoid confusion between the entire process environmental review (assessment) and the second step state environmental review (assessment).

zadanie (technical assignment). The proponent then conducts all the necessary research and collects all the necessary data. Under "On Environmental Review" does not explicitly create the right to public participation in the environmental assessment process. However, the statute mandates that materials sent to SER reflect public opinion thereby indirectly requiring *obschestvennoe obsuzhdenya* (public discussions).[99] The Order 372 extends this requirement further by placing the responsibility for organizing "public discussions" on the proponent of the activity. It is important to note that the Order 372 uses the term "public discussions" in all but two instances when it refers to the process as "consultation."[103] Under the Order 372, the developer conducts "public discussions" with the municipal government making it, at least in theory, a more inclusive process.

It is important to note that Order 372 sets the following two principal objectives of public discussion: (1) informing the public about the proposed activity; and (2) identifying public preferences.[103] The latter objective translates into the statutory requirement of taking public preferences in to account when making the final decision on the proposed project or activity. However, neither the "On Environmental Review" nor Order 372 specify the extent and ways in which the preferences need to be considered in the decision-making process.

Public meetings are not mandatory as surveys or referendums also may be used to inform the public and determine its preferences.[103] The proponent of the activity must carefully document public discussion results, include them in the draft OVOS materials and allow the public to examine and comment on the draft. Availability of other modes of "public discussions" notwithstanding, we found that it is customary to conduct a public meeting. In fact, developers face significant public opposition when they do not follow this practice. For example, in 2006, during the environmental assessment of the East Siberia – Pacific Ocean (ESPO) pipeline, Transneft, the pipeline developer, along with federal and state authorities attempted to use approval by Sakha President's Public Consultation Council as a form of "public discussion." Moving public discussion into the "halls of power" when the technical documentation and preliminary OVOS materials were not completed drew ire from Sakha environmental NGOs.[104] In a joint letter to the Sakha President, the environmentalists pointed out that the Consultation Council failed to consider several important factors ranging from environmental and climatic conditions to potentially irreversible damage to indigenous communities due to damage to reindeer migration routes and fishing and hunting grounds.[105]

Gazprom did not repeat the Transneft's mistake with the Power of Siberia and organized public meetings as part of the OVOS. However, Gazprom's responsibilities did not include the assessment of the entire pipeline because of the aforementioned December 2006 amendments to "On Environmental Review." Interestingly, the public meetings conducted in Sakha did not attract nearly as much attention as in the ESPO's case. Although we cannot point at a single reason for such a public apathy, we deem a combination of the following factors primary responsible.[106][xvii]

Evenki from Olekminskiy and Aldanskiy districts of Sakha petitioned Gazprom in 2010 to plan the pipeline route parallel to that of ESPO's. Remarkably, Olekmenskiy district Evenki volunteered to take the burden of another pipeline.[7] In addition, only isolated waste disposal sites located near compressor stations and not the compressor stations themselves, the actual pipeline, and all the

[xvii] Other researchers found similar public apathy in other parts of the world.[106]

supporting infrastructure were subject to OVOS.[102] Finally, although formally in compliance with the legal requirements, the notice and format of the public meetings had significant shortcomings. For example, the notice for the meeting regarding two waste disposal sites at the Amginskaya and Nimnyrskaya compressor stations was published in two issues of the national newspaper "Transport Rossii" (Russian Transport), one issue of the regional "Yakutia" newspaper, two issues of local "Munitsipalny Vestnik" newspaper, as well as on the local government's web-site. Although it is conceivable that the news reached some local population, it certainly avoided indigenous people in the forest busy with their reindeer, as well as hunting and fishing. The meeting itself had only one person representing the public, the head of a local library. Unsurprisingly, no indigenous peoples were present at the meeting. [107]

After finalizing the OVOS documentation, the process moves to the Federal Service for Oversight of Natural Resources (*Rosprirodnadzor*) for an SER. In its essence, SER resembles a project documentation review by a group of professionals deemed to have relevant expertise[99] An expert commission is formed on an ad hoc basis for each individual project from staff and invited experts. At this stage, the process is not inclusive as only municipal and provincial governments have the right to recommend their own experts to serve and observers at an expert commission meeting. [99] Deliberation is limited to a discussion among experts at the commission's meeting. All seven waste disposal facilities associated with the pipeline did not appear to have any issues at the SER stage. Interestingly, expert commissions for all seven sites were formed on the same date. Furthermore, all of them were approved on the same date, right before the deadline.[102]

In addition to SER, "On Environmental Review" sets forth perhaps the most inclusive mechanism that offers the most capacity for deliberation the so-called public environmental assessment.[99] This type of assessment is in not mandatory and can be initiated by an NGO initiated, citizens, and a local government.[99] A party wishing to conduct a public environmental assessment, must petition the local government to allow it. The government may decline the petition on several grounds. A project or activity information about which may contain "commercial secrets" gives government officials an easy reason to deny the petition as virtually any economic activity or project contains such sensitive information.[99] The practical effect of public environmental assessments is dampened by the fact that their results are not binding. The only requirement posed by "On Environmental Review" is that a public environmental assessment must be considered during the SER, which is always mandatory.

The Law of Sakha (Yakutia) "On Ethnological Review in the Areas Traditionally Occupied and Utilized by Indigenous Small-numbered People of the Republic Sakha's (Yakutia) North" ("On Ethnological Review") creates another opportunity for indigenous deliberation and inclusion into the decision-making process. Pursuant to Article 3, the principal objectives of the statute are to identify risks to indigenous communities posed by industrial activities and projects, to avoid or mitigate such risks, and, when appropriate, offset impacts with monetary compensation.[108]

On Ethnological Review is triggered if a project or activity is proposed to take place in traditionally indigenous areas and it affects the environment that indigenous peoples traditionally have inhabited or their socio-cultural status quo.[108] Indigenous people have the right to delegate representatives to participate in an ethnological expert commission. They have the right to participate directly in the assessment only in the case if preparation and development of federal and regional programs directed at environmental protection and natural resource development.[108]

This participatory right is especially important because gives indigenous people access to strategic decision-making. At least in theory "On Ethnological Review" comes with real legal power because no activity or project that is subject to the assessment can proceed without an ethnological expert commission approval.[108]

Unfortunately the implementation of the statute is hampered by significant formal shortcomings. The former originates from articles 71 and 72 of the Russian Constitution that create a joint (federal and provincial) jurisdiction over indigenous affairs.[109][110] However, pursuant to article 76, provincial laws cannot contradict federal laws and if they do, federal law prevails. This provision presents developers with a strong argument against any additional restrains imposed by provincial law. For example, a decision to deed an area for recreational use under the federal Forest Code can trump a decision to designate an area for traditional use made under provincial law. [110]

The results of our fieldwork and legal analysis indicate that the Power of Siberia undoubtedly falls within the purview of the On Ethnological Review and thus, requires an ethnological assessment. The pipeline crosses areas traditionally inhibited by indigenous reindeer herders, fisherman, and hunters. The impacted indigenous peoples have already expressed their concerns over allocation of some areas used as traditional reindeer pastures and hunting grounds for the pipeline construction. The indigenous forest dwellers are also concerned about the influx of temporary workers and the lasting socio-economic changes that such migration brings.

However, despite the fact that the pipeline construction commenced in September 2014, an ethnological assessment is yet to occur. Although we are not familiar with any formal discourse regarding this rather glaring omission, Gazprom's informal position about which we learned during our fieldwork is that because the Power of Siberia will run parallel to the ESPO pipeline, it will not create new impacts, thus, it will not need an additional ethnological assessment. Another reason why it is difficult for the regional government compel a powerful developer to conduct an ethnological assessment is because areas of traditional habitation and subsistence of indigenous peoples have not been formally designated as such.[111] Instead, the regional government engages with developers on an ad hoc basis trying to persuade developers to carry out the assessment. For example, Pavel Marynychev, a provincial deputy prime minister stated that the regional government "almost reached an agreement" with Gazprom to conduct an ethnological assessment of an area located at the Chayandinskoe gas field.[112]

VI. Conclusion

The Power of Siberia together with the development of Chayandinskoe and Kovyktinskoe gas deposit is set to become a project that will impact the socio-economic life of Eastern Siberia for many years. The discourse regarding potential benefits of the project certainly reflects its "system-forming" nature. However, the current system of identifying and scrutinizing the project's risk treat the Power of Siberia pipeline as a conglomeration of isolated industrial projects that are only remotely related to each other.

It is not difficult for a government official located thousands of kilometers from the project to rationalize such a compartmentalization. The compartmentalization comes with answerable research questions and scientific methods. Holistic approach is complicated, messy, and expensive. It raises additional questions some of which experts struggle to answer. Yet an indigenous reindeer herder in Yakutia does not see the process any other way. The plethora of sub-contractors each

responsible for its own part of the project brings a great deal of interruption to the socio-economic fabric of local communities. Such "invasions" are seen as a sign of chaos to be brought on the indigenous land. Roads, quarries, individual outbuildings, and other infrastructure comprise the physical side of the chaos. They pepper the forest landscape with examples of industrialization that will remain there long after their human creators are gone.

Thus, a mind of a reindeer herder or a hunter has a qualitatively different point of departure for dealing with risk. It emphasizes risk identification within the totality of all possible risks over a model that focuses on an in-depth analysis of a selected few risks while ignoring others, sometimes simply because they are difficult to quantify. It also does not limit itself to a particular time period because life and practice do not stop. Some spatial movements and temporal interruptions notwithstanding, by and large, the life of a reindeer herder and a hunter, his family, and community occur in the same geographic area and depend on the continuity of practice.

As we noted above, the Power of Siberia comes with many risks that were not subject to mandatory review and deliberation. Yet if these risks come to fruition, they will not be limited to the impacts on Gazprom's financial bottom line and physical environmental damages. They are certain to affect many lives and livelihoods in Eastern Siberia because Power of Siberia is thought to be the "system-forming" infrastructure and project intended to be one of the pillars of the region's economy. Power of Siberia also comes with a bundle of geopolitical implications wrapped in a thirty-year commitment, which given historically uneven relationships between Russia and China can produce significant ripples on both sides of the border, as well as internationally.

It would have been naïve for us to suggest that a direct and literal application of the observed local approach to risk would produce a comprehensive and immediate solution. As we highlighted in this article, the applicable Russian policy, legal, regulatory regime remains unwelcoming to integration of various types of knowledge and rationalities. However, we think that there are pathways for integrating the concept of indigenous approach to risk that can contribute to building capacity to handle systemic risks posed by energy mega-projects.

The first pathway is integration of multiple rationalities and types of knowledge into the risk governance process. We do not suggest that government or corporate decision-makers should try channeling their inner forest dweller and see the world as a whole. After all, these kinds of decisions involve people, spaces, and relationships deeply imbedded in advanced modernity. Largely owing to their advanced modernity origin, the current government and corporate decision-makers bring types of knowledge and rationalities not known indigenous hunters and reindeer herders. Hence, what is important here is reconciliation of different data, views, and positions. Whether it is referred to as "inclusive participation" or "communicative rationality" the overall objective of this process should be determining what is at stake for all directly and indirectly affected parties thereby reducing "mental" compartmentalization. [113][114] Furthermore, justice and equity considerations should be given priority over economic efficiency as the basis for evaluating spatial and temporal distribution of risks and benefits of the proposed activity or project.[xviii] Finally,

[xviii] A skeptic would point at failed earlier attempts to bring laypeople and experts into the risk analysis process. It is important to note that such attempts were made prior to the emergence of risk governance. This concept not only argues for inclusion of deliberation in risk analysis, it also provides roles for different stakeholders that go beyond the traditional experts and laypeople divide.

the concept of "collective agency" may become useful to level the balance of negotiating power and to increase process efficiency.[115] When various stakeholders, local non-indigenous and indigenous population, for example, group together to share their perception of risk and to evaluate risks and benefits, they form a unified position on how to deal with risk. They can also do so in parallel with other stakeholder groups thereby making the process more efficient. This, of course, means that the government and industry, the two actors usually not requiring group representation, must be prepared to consider and *act* upon the divergent rationalities and types of knowledge expressed in stronger unified voices.

The second pathway targets diminishing spatial and physical compartmentalization by enlarging the scope of a project or activity subject to risk governance. As we noted throughout this article, reducing a transnational pipeline system, viability of which depends on the concurrent development of two natural gas fields, to a few isolated industrial infrastructure units does not position it for a comprehensive analysis. Because risks associated with each of the aforementioned waste disposal sites are viewed as belonging to that particular compressor station, systemic risks associated with the construction and operation of a $70 billion energy megaproject are not considered at all. On the other hand, the Russian leadership and Gazprom are not shy at touting the systemic *benefits* of the Power of Siberia pipeline distorting the cost – benefit analysis. Bringing large, systemic risk-laden projects and activities back within the purview of On Environmental Review will be a step in the right direction. Adopting an SEA framework and extending it to socio-economic risks and impacts will be a start of thoughtful policy.

The third pathway is the expansion of the timeline that used to assess and evaluate a project or activity. Even when a "baseline" is mandated to assess ensuing negative consequences, it represents is a snapshot of usually environmental conditions prior to the proposed project or activity. Such view disregards the existence of environmental, socio-economic, and political processes and practices that resulted in the "snapshot." It also ignores potential disruptions to the processes and practices during and after a project or activity. Thus, moving the temporal goalposts is likely to reveal the aforementioned temporal continuity, which in turn should put it on the list of items considered during the risk assessment and risk evaluation process.

The fourth pathway is the adoption of a meaningful "zero option," a scenario under which an activity or a project does not go forward. Much of the criticism of the environmental assessment framework in the Russian Federation and ethnological assessment in Sakha is focused on the flaws in its implementation and enforcement. For example, as we noted in this article construction of both the ESPO and Power of Siberia pipelines commenced before environmental and ethnographic assessments were conducted. We believe that a presence of a meaningful zero-option would have forced the corporate decision-makers to think long and hard before investing heavily in the projects that could have become obsolete with a single resolution of an expert commission. However, a larger implication of not being able to say no to a pipeline, factory, or a mine is the preclusion of exploring other qualitatively divergent means of obtaining societal benefits. And such determinism hardly qualifies as a pathway to flourishing life, indigenous or not.

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