

# THE ARCTIC IS HOT: ADDRESSING THE SOCIAL AND ENVIRONMENTAL IMPLICATIONS

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The Arctic is hot. Russia's full-scale invasion of Ukraine in 2022 has resulted in suspended cooperation with Russia in the Arctic Council; Finnish and future Swedish membership of the North Atlantic Treaty Organization (NATO) means that seven of the eight members of the Arctic Council will also be NATO member states; and a deepening of Chinese–Russian ties over the Arctic has increased security tensions in the region.<sup>1</sup> At the same time, the Arctic is warming four times faster than the global average and is predicted to be ice-free at its summer minimum at least once before 2050 under all climate change scenarios.<sup>2</sup> New resources and fish stocks, shorter shipping routes and unclaimed territory are becoming available as the ice melts.<sup>3</sup> In addition, the Arctic holds 13–30 per cent of the world's unexploited oil and gas.<sup>4</sup> There are also large deposits of nickel, zinc and rare earth elements in the Arctic that are key to renewable energy and the green transition.<sup>5</sup>

These changes in the Arctic are affecting the development aims of actors such as the European Union (EU). Recent changes in Kiruna, a Swedish mining town located approximately 200 kilometres north of the Arctic Circle, provides evidence of these aims. When Sweden assumed the rotating presidency of the Council of the EU in January 2023, it held its first Swedish meeting there.<sup>6</sup> Two key announcements relating to Kiruna were made at that time: confirmation of the largest deposit of rare earth elements in

<sup>1</sup> Boschetti, N. et al., 'Commercial space risk framework assessing the satellite ground station security landscape for NATO in the Arctic and High North', Paper presented at the 2022 IEEE Military Communications Conference, Washington, DC, 29 Nov.–2 Dec. 2022; and Ciolan, I., 'The EU's geopolitical awakening in the Arctic', European Policy Centre, 11 Apr. 2022.

<sup>2</sup> Rantanen, M. et al., 'The Arctic has warmed nearly four times faster than the globe since 1979', *Communications Earth & Environment*, vol. 3, no. 1 (Aug. 2022); and Intergovernmental Panel on Climate Change (IPCC), Sixth Assessment Report, Working Group 1: The Physical Science Basis, 'Regional fact sheet: Polar regions', [n.d.].

<sup>3</sup> Zarkan, L. C. and Raju, N., 'SATCOM on the ice: Arctic Circle operations put to the test with climate change', *Nato Legal Gazette*, no. 43 (Dec. 2022).

<sup>4</sup> Ciolan (note 1).

<sup>5</sup> International Renewable Energy Agency (IRENA), *Geopolitics of the Energy Transition: Critical Materials* (IRENA: Abu Dhabi, 2023); and Loginova, J., Sharma, V. and Kemp, D., *The Changing Arctic and Just Energy Transitions: Exploring Patterns of Community Consultation and Consent*, Centre for Social Responsibility in Mining, Sustainable Minerals Institute (University of Queensland: Brisbane, 2023).

<sup>6</sup> Swedish Presidency of the Council of the European Union, 'Swedish government to welcome European Commission to Kiruna', 11 Jan. 2023.

## SUMMARY

● The Arctic is becoming more hotly contested and attracting new development ambitions. The European Union (EU) is one actor that is turning to the Arctic to achieve its climate, energy, space-related and security goals. However, this increased interest can result in negative social and environmental local implications if not properly planned for and considered.

This SIPRI Policy Brief provides an overview of the EU's focus on the Arctic, with a particular focus on Kiruna, and the importance of human-centred and precautionary approaches.



Europe, namely the Per Geijer deposit; and the inauguration of Spaceport Esrange, which will commence launches of small satellites in 2024.<sup>7</sup> These developments are important for the EU and Sweden but, if not properly planned for, they could spill over into local social and environmental conflict and have long-term consequences.<sup>8</sup>

The case of the Arctic sheds light on the importance of balancing the trade-offs inherent in economic and development ambitions. This SIPRI Policy Brief first explores the EU's growing interest in the Arctic and its efforts to reduce negative spillovers. It then takes Kiruna as an example of where interests linked to mining and space-related activities could lead to local controversy. The policy brief concludes with starting points for how to ensure more mutually beneficial outcomes moving forward.

## THE EU'S GROWING INTEREST IN THE ARCTIC

The Arctic is becoming of strategic importance to the EU, including for its climate, energy and space-related possibilities.<sup>9</sup> The EU's 2021 Arctic Policy promotes cooperation and sustainable development in the region, including through green and blue energy projects and the supply of critical materials that are key to implementing the European Green Deal (EGD), a package of policy initiatives aimed at achieving net-zero greenhouse gas emissions by 2050.<sup>10</sup> The EU's 2023 proposal for a Critical Raw Materials Act underpins the need for EU self-sufficiency, strengthened capacities for extraction and refining of raw materials, and diversified supply chains.<sup>11</sup> Europe is currently almost entirely dependent on imports of critical materials, 70 per cent of which are sourced from Russia and China, but it has been set on reducing this dependency, especially given shortages in the aftermath of the Covid-19 pandemic and the energy crisis following Russia's invasion of Ukraine in 2022.<sup>12</sup>

The Arctic is also important for expanding EU space capabilities. The EU's 2023 Space Strategy for Security and Defence outlines the signifi-

<sup>7</sup> Luossavaara-Kiirunavaara Aktiebolag (LKAB), 'Europe's largest deposit of rare earth metals is located in the Kiruna area', 12 Jan. 2023; and Swedish Space Corporation, 'The world watched the inauguration of Spaceport Esrange', 17 Jan. 2023.

<sup>8</sup> Dabelko, G. D. et al. (eds), *Backdraft: The Conflict Potential of Climate Change Adaptation and Mitigation*, Environmental Change and Security Program Report, vol. 14, no. 2 (Wilson Center: Washington, DC, 2023).

<sup>9</sup> Hanaček, K. et al., 'On thin ice: The Arctic commodity extraction frontier and environmental conflicts', *Ecological Economics*, vol. 191 (Jan. 2022); European Commission, Joint communication on a stronger EU engagement for a peaceful, sustainable and prosperous Arctic, JOIN(2021) 27 final, 13 Oct. 2021; and Loginova, Sharma and Kemp (note 5).

<sup>10</sup> European Commission, 'A European Green Deal: Striving to be the first climate-neutral continent', 11 Dec. 2019.

<sup>11</sup> Wilmot, S., 'Formining EV metals, the Arctic is hot', *Wall Street Journal*, 13 Feb. 2023; European Commission, Proposal for a regulation of the European Parliament and of the Council establishing a framework for ensuring a secure and sustainable supply of critical raw minerals and amending Regulations (EU) 168/2013, (EU) 2018/858, 2018/1724 and (EU) 2019/1020, COM(2023) 160 final, 16 Mar. 2023; and European Commission, 'Critical raw materials: Ensuring secure and sustainable supply chains for EU's green and digital future', Press release, 16 Mar. 2023.

<sup>12</sup> LKAB (note 7); Jonsson, E. et al., 'Critical metals and minerals in the Nordic countries of Europe: Diversity of mineralization and green energy potential', eds M. Smelror, K. Hanghøj and H. Schiellerup, *The Green Stone Age: Exploration and Exploitation of Minerals for Green Technologies* (Geological Society: 2023); and European Commission, 'Critical raw materials: Ensuring secure and sustainable supply chains for EU's green and digital future' (note 11).



cance of its space assets and the need to defend them, especially given the augmented militarization of space and the increased use of dual-use space assets by Russia, China, the United States and India.<sup>13</sup> Space technologies can also promote Earth observation to support climate change and scientific monitoring. Polar orbiting satellites launched from the Arctic, for example, are uniquely placed for Earth observation. Since the Earth rotates while a satellite orbits, a satellite in polar orbit passes over both poles and travels directly overhead every point on Earth.<sup>14</sup>

### Addressing the social and environmental implications

Although the Arctic can provide raw materials and expand space capabilities, the resulting social and environmental impacts can also be significant.<sup>15</sup> Moreover, the economic benefits are not always equitably shared and any new jobs created are not always compatible with local competences.<sup>16</sup> The extraction of resources can also result in competing land and resource claims with Indigenous communities. A study of 53 socio-environmental conflicts related to the economic extraction of natural resources in the Arctic found that Indigenous people were involved in 64 per cent of them.<sup>17</sup> For the Sami, the EU's only Indigenous group, these challenges add to those already faced by climate change, which is reducing the availability of lichen used as a winter food source for their reindeer and grazing lands more generally.<sup>18</sup>

In Sweden, conflicts with the Sami are often related to mining and renewable energy projects. Nine of the 12 metal mines in Sweden are located on Sami lands.<sup>19</sup> Sweden is dependent on hydropower for around 45 per cent of its electricity generation, and 80 per cent of this also takes place on these lands.<sup>20</sup> Wind power generation through projects like the Markbygden Wind Farm, the largest worldwide with expected completion in 2025, has also reduced access to reindeer herding routes.<sup>21</sup> Sweden is a signatory to the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), but has not ratified the International Labour Organization's Convention 169 on Indigenous and Tribal Peoples, which upholds rights to self-determination and control over land and resources.

<sup>13</sup> European Commission and High Representative of the Union for Foreign Affairs and Security Policy, European Union Space Strategy for Security and Defence, Mar. 2023; and Muñoz, R. G. and Portela, C., 'The EU space strategy for security and defence: Towards strategic autonomy?', EU Non-Proliferation and Disarmament Consortium, Non-Proliferation and Disarmament Paper no. 83, June 2023.

<sup>14</sup> See Wright, D., Grego, L. and Gronlund, L., *The Physics of Space Security: A Reference Manual* (American Academy of Arts and Sciences: Cambridge, MA, May 2005), p. 33.

<sup>15</sup> Hanaček et al. (note 9).

<sup>16</sup> European Polar Board, Northern Periphery and Arctic Programme, 'EU Arctic Forum and Indigenous People's Dialogue, 2023', 22 Feb. 2023; and Hanaček et al. (note 9).

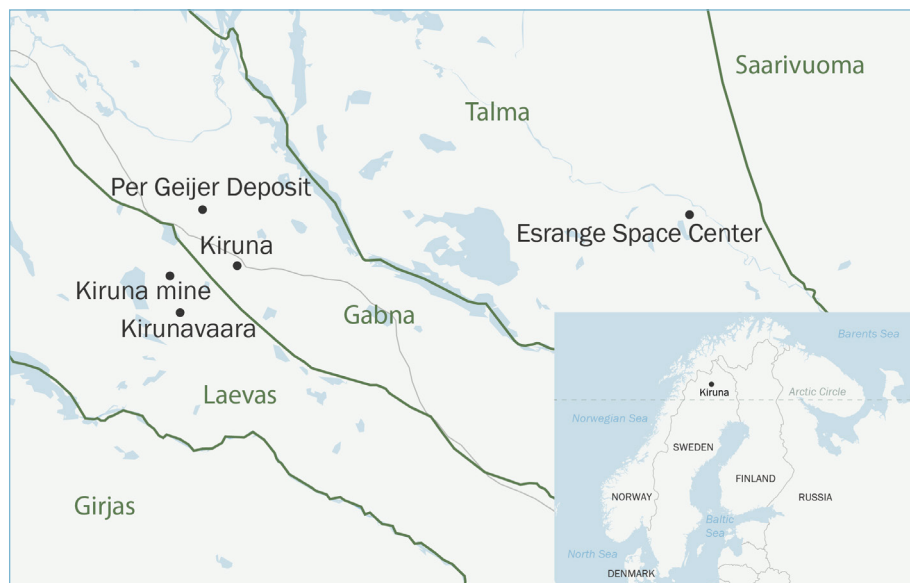
<sup>17</sup> Hanaček et al. (note 9). Conflicts mainly included street protests and marches, some of low intensity but some violent and leading to arrests or the violent targeting of protestors.

<sup>18</sup> Rankin, J., 'Why a Swedish town is on the move—one building at a time', *The Observer*, 5 Feb. 2023; and Worldwide Fund for Nature (WWF) Global Arctic Programme, 'Arctic reality check: An uncertain future', *The Circle*, July 2023.

<sup>19</sup> McVeigh, K. and Thymann, K., "'We borrow our lands from our children": Sámi say they are paying for Sweden going green', *The Guardian*, 10 Aug. 2022.

<sup>20</sup> Larsen, R. K. and Inga, K., 'Sámi lands and hydroelectric power in Sweden: What's the potential to redress harm and injustice?', Stockholm Environment Institute (SEI) Perspective, 20 Feb. 2020.

<sup>21</sup> Szpak, A., 'Relocation of Kiruna and construction of the Markbygden wind farm and the Saami rights', *Polar Science*, vol. 22 (Dec. 2019).



**Figure 1.** Map of the Kiruna region, including five Sami villages, portraying overlapping interests and stakeholders

Source: Adapted by SIPRI from Sunesson, A., ‘Karta över Sveriges samebyar’ [Map of Sweden’s Sami villages], Sametinget, 12 Apr. 2018.

The EU recognizes the need to address these local impacts. Its ‘Fit for 55’ package, which reduces net greenhouse gas emissions by at least 55 per cent by 2030 and supports implementation of the EGD, emphasizes a socially just and fair energy transition and protecting the Arctic from pollution.<sup>22</sup> The EU’s 2021 Joint Communication on the Arctic reaffirms its responsibility to protect and minimize its environmental footprint there.<sup>23</sup> The 2023 Kiruna Declaration notes the vulnerability of remote areas such as the Arctic to energy transitions and the importance of sustainable place-based development.<sup>24</sup> In June 2023, the EU recognized that external interests in the Arctic

are ‘increasing with multifaceted social, environmental and economic consequences’.<sup>25</sup>

The EU also upholds Indigenous rights. The EU supported the adoption of UNDRIP in 2007, which also grants the right to free, prior and informed consent, enabling Indigenous peoples to give or withhold their consent to projects.<sup>26</sup> Article 3 of the Treaty of the EU protects European cultural heritage, which Sami reindeer husbandry is a part of. However, the EU does not have an internal Indigenous peoples policy, which could help to ensure that the negative impacts of conflicts linked to projects supporting the EGD in Europe are addressed internally within the EU’s framework and to uphold these rights.<sup>27</sup>

## THE CASE OF KIRUNA

Kiruna is the northernmost city in Sweden, located in Swedish Lapland, around 200 km north of the Arctic Circle, with a population of around 23 000 people (see figure 1). It was built in 1900 to facilitate iron ore extraction from the mountain of Kirunavaara (meaning ‘Kiruna mine’), which is the largest and purest underground deposit in the world and the source

<sup>22</sup> Council of the European Union, ‘“Fit for 55”: Council adopts key pieces of legislation delivering on 2030 climate targets’, Press release, 25 Apr. 2023.

<sup>23</sup> European Commission (note 9).

<sup>24</sup> European Committee of the Regions, Declaration of the Bureau of the European Committee of the Regions, ‘Achieving a green, just and fair transition with and in all European regions’, Kiruna, 28 Apr. 2023; and Cornelsen, H., ‘Kiruna declaration calls for more support to remote areas to achieve just transition’, European Committee of the Regions, 28 Apr. 2023.

<sup>25</sup> European Commission, Joint communication on the climate–security nexus, JOIN(2023) 19 final, 28 June 2023, p. 2.

<sup>26</sup> Saami Council, ‘Sapmi–EU strategy’, 2022.

<sup>27</sup> Nystø Keskitalo, A. and Götze, J., ‘A rights-based approach for implementing the European Green Deal’, German Institute of Development and Sustainability (IDOS), 6 Feb. 2023.



of approximately 90 per cent of Europe's iron ore.<sup>28</sup> Kiruna is also home to the Sami and Tornedalian Indigenous peoples, who populated the lands long before the town was constructed. It has the highest concentration of Sami population in Sweden, with eight different Sami villages (known as 'samebyar') and around 2 500 people, constituting approximately 10 per cent of Kiruna's population.<sup>29</sup> In Kiruna, the two current issues of mining and space ambitions shed light on the importance of paying attention to the local impacts of development and economic ambitions.

### Mining projects and stakeholder consultations

Mining in Kiruna points to the value of early stakeholder consultation. Strict environmental and social standards, as well as skills-based and financial requirements, mean that it could be 15 years before the Per Geijer deposit of rare earth elements can be extracted.<sup>30</sup> The state-owned Swedish mining company that discovered the deposit, Luossavaara-Kiirunavaara Aktiebolag (LKAB), has highlighted its importance for the EGD and the proposed Critical Raw Materials Act.<sup>31</sup> If not properly planned, however, mining the deposit could have negative local impacts and lead to project delays and contestation later on.

Kiruna has a history of Sami resistance against mining. The Kiruna mine is located within nationally recognized Sami reindeer herding grounds and inside the EU's Natura 2000 protected areas network.<sup>32</sup> It has cut off Sami reindeer routes and access to lakes previously used for fishing.<sup>33</sup> To counter the increased risk of subsidence and accommodate additional layers of iron ore extraction by LKAB, in 2004 it was decided that Kiruna would relocate 3 km to the east. This relocation is expected to be completed in 2035.<sup>34</sup> The Sami claim they were not properly consulted prior to projects for relocation being accepted and were denied compensation for the time spent in these consultations.<sup>35</sup> The Swedish government has responded that the Sami villages of Gabna and Laevas did participate in research on how reindeer routes would be impacted by the relocation, and thus it had fulfilled its obligations under UNDRIP.<sup>36</sup>

Mining the Per Geijer deposit also faces pushback. A 2023 statement by the Saami Council criticizes the decision to mine the deposit for its anticipated impact on reindeer herding in Gabna and Laevas, arguing that: 'The Saami

<sup>28</sup> Avango, D., Pashkevich, A. and Rodon, T., 'The making and re-making of high modernist towns in the circumpolar north', *Extractive Industries and Society*, vol. 12 (2022); and Bennett, M., 'Kiruna, Sweden: An Arctic city pivots from underground to outer space', *Cryopolitics*, 29 Dec. 2022.

<sup>29</sup> Maestrini, E., 'Kiruna, mining and reindeer: How Sami communities are paying the price for the green transition', *The Perspective*, 7 Mar. 2023.

<sup>30</sup> LKAB (note 7).

<sup>31</sup> LKAB (note 7); and LKAB, 'Europe's largest deposit of rare earth elements now 25 percent larger: Today marks the first step in critical review', 12 June 2023.

<sup>32</sup> Loginova, Sharma and Kemp (note 5).

<sup>33</sup> Frost, R., 'Mining Europe's biggest rare earth deposit could make life "impossible" for Sámi communities', *Euronews*, 11 Feb. 2023.

<sup>34</sup> Bye, H-G., 'Opening of Kiruna's new city center', *High North News*, 2 Sep. 2022.

<sup>35</sup> Malmgren, J. et al., 'Mining towns in transitions: Arctic legacies', ed. S. Sörlin, *Resource Extraction and Arctic Communities: The New Extractivist Paradigm* (Cambridge University Press: Cambridge, 2022), pp. 229–48.

<sup>36</sup> Szpak (note 21).





lands are being disproportionately affected . . . [and] used to justify and greenwash the unsustainable consumption habits of the Western world.<sup>37</sup> It accuses LKAB of not informing the Gabna village in advance of the public announcement. LKAB has countered the claim, saying it had already announced the presence of abundant rare earth elements in Kiruna and was in dialogue with the Sami villages to avoid or compensate for the impacts on local lands and reindeer husbandry.<sup>38</sup> In return, LKAB hopes it will be able to move forward with its environmental permit application and eventually extract the deposit.<sup>39</sup>

### Space ambitions and precautionary approaches

Space ambitions in Kiruna demonstrate the importance of proceeding with caution and more information. The Esrange Space Center expects to launch its first satellites early in 2024 from its new spaceport.<sup>40</sup> Esrange has previously only launched rockets and balloons but will now be able to support Earth observation to measure and mitigate the impacts of climate change, enhance maritime activities and search and rescue operations, and improve the tracking of military troops.<sup>41</sup> However, its history also illustrates the need to understand stakeholder perspectives and value systems.

Esrange was established in Kiruna in 1966 because of its suitability for testing and launching rockets, easy transport access and proximity to the Kiruna Geophysical Observatory, and the vast and largely unpopulated area.<sup>42</sup> For the population of Kiruna, Esrange provided the potential to develop local infrastructure and alternative employment to the mining and forestry sectors. A scientific and technical working group was tasked by the European Preparatory Commission for Space Research with approving the location and construction. It found that although Esrange would impact seasonal Sami reindeer herding routes, this would only occur for four months of the year. It identified no security or safety issues. However, the working group underestimated the significance of seasonal land use for reindeer herders.<sup>43</sup> Safety zones, shelters and warning zones were set up for the protection of reindeer and herders, and compensation was paid for the disruption, but new administrative zones divided the land and herders lost their traditional, year-round access.<sup>44</sup>

<sup>37</sup> Saami Council, 'The reindeer herding communities of Gabna and Laevas need help', 16 Jan. 2023.

<sup>38</sup> Sandin, O., 'Samisk kritik efter beskedet i Kiruna: "Historia av att gena i kurvorna"' [Sami criticism after the announcement in Kiruna: History of cutting corners], *Syre*, 13 Jan. 2023; and Stenberg Partapuoli, A. C. and Sjöstedt, M., 'Samebyn om LKAB:s planer: "Vi offras för att lösa EU:s beroende av Kina och Ryssland"' [Sami village on LKAB's plans: 'We are being sacrificed to solve the EU's dependence on China and Russia'], *SVT Nyheter*, 13 Jan. 2023.

<sup>39</sup> LKAB, 12 June 2023 (note 31).

<sup>40</sup> Swedish Space Corporation (note 7).

<sup>41</sup> Erdbrink, T. and Anderson, C., 'In Sweden's far north, a space complex takes shape', *New York Times*, 23 May 2021.

<sup>42</sup> Sheehan, M., 'Outer space and Indigenous security: Sweden's ESRANGE launch site and the human security of the Sami', ed. K. Hossain, *Human and Societal Security in the Circumpolar Arctic* (Koninklijke Brill NV: Leiden, 2018); and Swedish Space Corporation, 'Esrange Space Center', [n.d.].

<sup>43</sup> Milligan, T., 'From the sky to the ground: Indigenous peoples in an age of space expansion', *Space Policy*, vol. 63 (Feb. 2023).

<sup>44</sup> Sheehan (note 42); and Milligan (note 43).



What occurred in Esrang reflects a similar trend in space expansions in remote regions that are far from urban centres but inhabited by people whose heritage and livelihoods are attached to the land.<sup>45</sup> In Hawaii, a plan by the Canadian Astronomical Society to build a Thirty Metre Telescope (TMT) at the peak of Mauna Kea resulted in pushback from the native Kanaka Maoli people, who regard the mountain as sacred and belonging to the gods. In 2014, supporters of the TMT accused protestors of being anti-science. The Indigenous communities responded that they were not against science as such, but rather protecting the cultural heritage of the mountain and their lands, which cannot be understood through conventional science alone.<sup>46</sup> In 2022 an 11-member, state-appointed board, which includes representatives from astronomical observatories and native Hawaiian communities, was established to prepare to take stewardship of the mountain in 2028.<sup>47</sup>

The social and environmental impacts of Arctic space infrastructures remain largely underexplored.<sup>48</sup> Some experts fear that the expansion of launch sites or spaceports could harm habitats and have noise- and light-related implications for wildlife, while failed launches would spread toxic materials and debris, and could cause wildfires.<sup>49</sup> Although smaller satellites and reusable launch systems are more reliable and accessible, they could have a greater risk of failure and the scattering of debris and fuel.<sup>50</sup> In 2018, European satellites for environmental monitoring launched by rockets in Russia raised concerns among Inuit people in Canada that the resulting debris could spread toxic fuel and impact wildlife as launchers fell back into Arctic waters, especially given the lack of prior studies conducted on these impacts.<sup>51</sup> In Kiruna, the chair of the Sami village of Talma, who is also a reindeer herder, succeeding in blocking some of the expansion plans for Esrang in 2019 because of the expected impacts on his reindeer and herding routes; and now ‘his sights are set’ on tackling the predicted noise pollution.<sup>52</sup>

## STARTING POINTS FOR THE WAY FORWARD

The case of Kiruna demonstrates the importance of human-centred approaches that tap into different sources of knowledge. Mining in Kiruna highlights the need to ensure that stakeholders affected by the outcomes of projects are treated with respect and included throughout the entire process.<sup>53</sup> This can help to distribute economic benefits more equitably and

<sup>45</sup> Gorman, A. C., ‘La terre et l’espace: Rockets, prisons, protests and heritage in Australia and French Guiana’, *Archaeologies*, vol. 3, no. 2 (Aug. 2007).

<sup>46</sup> Bellrichard, C., ‘Canadian astronomers contend with issue of Indigenous consent over Hawaiian telescope project’, *CBC News*, 27 Sep. 2020; and Clery, D., ‘New front emerges in battle to build giant telescope in Hawaii’, *Science*, vol. 367, no. 6475 (Jan. 2020).

<sup>47</sup> Clery, D., ‘In Hawaii, new state panel stirs hope for giant telescope’, *Science*, 12 Jan. 2023.

<sup>48</sup> Sheehan (note 42); and Pozdnakova, A., ‘Space infrastructure for a sustainable Arctic: Opportunities and challenges of spaceport development in the High North’, *Arctic Institute, Center for Circumpolar Security Studies*, 31 May 2022.

<sup>49</sup> Brown, A., ‘Environmental concerns challenge states’ space ambitions’, *Stateline*, 6 June 2022.

<sup>50</sup> Brown (note 49).

<sup>51</sup> Burke, A., ‘Inuit worry about toxic splash from rocket debris in Canada’s Arctic waters’, *Canadian Broadcasting Corporation News*, 25 Apr. 2018.

<sup>52</sup> Erdbrink and Anderson (note 41).

<sup>53</sup> Conde, E. et al., ‘Decision-making for sustainable economic development in the Arctic’, *JUSTNORTH Policy Brief no. 1*, Aug. 2022.

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avoid the misreading of concerns.<sup>54</sup> It can also facilitate exchanges between mining industries, environmentalists and communities, and lead to quicker, more inclusive and fairer consent processes for projects.<sup>55</sup> Space ambitions in Kiruna stress the importance of precautionary approaches that draw from different knowledge and value forms.

Human-centred approaches can help to intertwine development and economic aims with human security. The Saami Council's 2019 Sámi Arctic Strategy encourages human-centred economic development that is respectful of the environment, co-designed and co-produced using Western and Indigenous knowledge, and rights-based.<sup>56</sup> The strategy emphasizes the importance of human security, which for the Sami includes self-determination, participation in decision making, control over their land and resources, and maintenance of their language and culture.<sup>57</sup>

Furthermore, human-centred approaches can encourage the co-production of knowledge to inform more precautionary decisions. Indigenous peoples have time-tested understanding of their Arctic environments and living sustainably, and their input can help to prevent unsustainable and conflictual projects.<sup>58</sup> Their ecological knowledge can complement Western methods of environmental protection by introducing approaches that move beyond pure science and rationality. The 2017 EU Arctic Stakeholder Forum report recognized the importance of development based on local Arctic and Indigenous knowledge as a scientific basis.<sup>59</sup> The Saami Council is also trying to bridge this knowledge gap and received funding in 2019 from the EU's Interreg Nord programme to achieve this aim. In 2022 it organized the first EU-Sámi Week, with a thematic focus on 'Art and Land', and workshops to create greater awareness of Sami culture and climate justice through dance, art, music and food. These initiatives can help to bring stakeholders together and support human-centred approaches to economic and development ambitions in the Arctic.

<sup>54</sup> Organisation for Economic Co-operation and Development (OECD), *Linking the Indigenous Sami People with Regional Development in Sweden*, OECD Rural Policy Reviews (OECD Publishing: Paris, 2019); and Tysiachniouk, M. S., Petrov, A. N and Gassiy, V. (eds), *Benefit Sharing in the Arctic: Extractive Industries and Arctic People* (Multidisciplinary Digital Publishing Institute: Basel, 2020).

<sup>55</sup> Muñoz, H. C. M. et al., 'Climate security and critical minerals mining in Latin America: How can business help?', *New Security Beat*, 7 Mar. 2023; and OECD, *Responsible Business Conduct in the Extractive and Minerals Sector in Latin America and the Caribbean* (OECD Publishing: Paris, 2022).

<sup>56</sup> Saami Council, 'The Sámi Arctic Strategy', Sep. 2019.

<sup>57</sup> Szpak (note 21).

<sup>58</sup> Westeson, J., "'Det var vi urfolk som uppfann den gröna omställningen!'" ["It was us Indigenous people who invented the green transition!"], *Amnesty Sápmi*, 27 May 2022; Hanaček et al. (note 9); and Milligan (note 43).

<sup>59</sup> Szpak (note 21).



This publication is a deliverable of MISTRA GEOPOLITICS, which is funded by MISTRA: the Swedish Foundation for Strategic Environmental Research.