

MEMORANDUM

to
Harvard University
regarding
Project SCoPEx

18 February 2021



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A. Executive Summary

- Harvard University (“Harvard”) is contemplating undertaking the scientific geoengineering project SCoPEX (Stratospheric Controlled Perturbation Experiment) with the aim to advance science on efficiency and risks of solar geoengineering (“the Project”). The Project includes two phases, the First Phase and the Second Phase. The First Phase involves launching a high-altitude balloon with a gondola to test the navigation system. The current tentative plan is to take place in June 2021 and Swedish Space Corporation (“SSC”) at Esvinge Space Center in Kiruna, Sweden (“Esvinge”) will manage and provide certain flight services for the test. This has been agreed in an agreement between Harvard and SSC dated 18 December 2020 (“the Agreement”). The test will not include *any* release of aerosol injections or other materials into the stratosphere.
 - The Second Phase, which is yet uncertain when and where to be carried out (if at all carried out) is not subject to the Agreement with SSC and is expected to include the release of approximately 100 – 2,000 g of aerosols into the stratosphere. Currently, the intention is to use calcium carbonate and/or other materials such as sulfates.
 - Esvinge is owned and operated by SSC. SSC has all the necessary permits and regulatory approvals to carry out the First Phase of the Project pursuant to the Swedish Electronic Communication Act. As Harvard will use a satellite telephone instead of a radio transmitter, Harvard will not need to obtain a permit regarding radio communication.
 - The Swedish Space Act is not applicable on the Project as it will take place in the stratosphere. Swedish environmental law does not affect the First Phase of the Project and an environmental impact assessment is not required.
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B. Scope of work

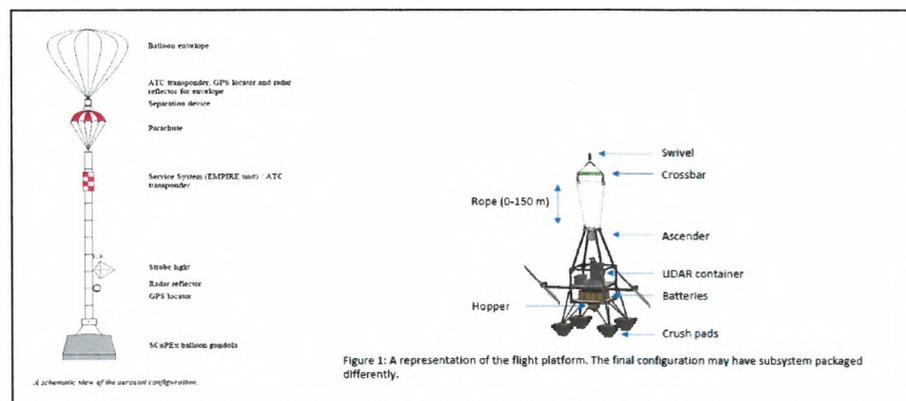
1. Setterwalls Advokatbyrå AB ("Setterwalls") has been retained by Harvard to conduct a legal review in relation to the Project.
2. The Swedish legal aspects of the Project in respect of which Harvard has instructed Setterwalls to provide legal advice are the following:
 - a) *To verify that SSC has all the necessary regulatory permits and approvals and would be in compliance with Swedish laws in order to carry out the First Phase, limited to the testing of the navigation of one balloon and the gondola to be launched over Sweden into the stratosphere.*
 - b) *As regards the First Phase, to which extent*
 - (i) *Swedish environmental law and/or environmental EU directives and regulations are applicable,*
 - (ii) *regulations on environmental impact assessments are applicable, and*
 - (iii) *potential other relevant Swedish laws are applicable.*
 - c) *To address whether the potential implementation of the Second Phase of the Project including release of material into the stratosphere would in any way affect the conclusions related to the questions in respect of the First Phase.*

C. The SCoPEX project

3. The purpose of the Project is to advance understanding of stratospheric aerosols that could be relevant to solar geoengineering, by simulations to provide modelers with experimental results vital to address specific scientific questions. According to the description of the Project, such simulations are the primary tool for estimating the risks and benefits of solar geoengineering. Currently, there is a concern within the Project that limitations of information results in an overestimation of the simulations. Moreover, an advance knowledge on interaction of particles in the stratosphere may increase the expertise on how to mitigate the global warming by preventing solar rays from reaching the earth.¹ The intention is that the Project will consist of two phases, The First Phase and the Second Phase.

C.1 First Phase

4. The First Phase is a flight test where an unmanned free balloon, carrying a gondola with scientific equipment, will be launched to an altitude of 20 - 22 km (which constitutes the stratosphere²) from Esrange.
5. Esrange is located in northern Sweden (approximately 45 km east of Kiruna) and is since 1972 owned and operated by SSC, which is wholly-owned by the Swedish State. SSC's operation consist of a *public assignment* combined with a *commercial assignment*. The public assignment is merely to own, operate and develop Esrange. The commercial part includes three business areas: Science & Launch Services, Satellite Ground Network Services and Spacecraft operations & Engineering Services. Stratospheric balloon launches are performed by the Science and Launch Services department and has been conducted at Esrange since 1966. The launched balloons have various scientific or technical instruments on board for research and technical development.
6. The flight platform that will be tested has not flown before. The balloon is owned by Harvard and manufactured by the US company Raven Aerostar. The nominal size and weight of the balloon is 16,766 cubic meters and 176 kg, respectively.



¹ <https://www.keutschgroup.com/scopex> (2021-02-07).

² https://www.nasa.gov/mission_pages/sunearth/science/atmosphere-layers2.html (2021-02-05).



7. The gondola, also owned by Harvard, has a size of circa 2.5 x 2.5 x 3.5 m, and a weight of around 600 kg. Additional equipment weighing approximately 300 kg will *inter alia* be the parachute, communication equipment, ballast, flight safety system etc. The balloon and gondola including the additional equipment will have a total weight of approximately 1,085 kg, see schematic views of the balloon and gondola above.
8. The purpose of the First Phase launch is purely to test the navigation of the balloon and gondola. No material will be released into the stratosphere. At the end of the flight of the First Phase, the ropes that suspend the gondola from the balloon will be released. The balloon will then deflate and fall to the ground in a different location from the gondola. This platform test is tentatively planned to be performed in June 2021.

C.2 Second Phase

9. The plan of the SCoPEX project in the Second Phase is to release a small amount of 100 g - 2,000 g of material into the stratosphere. Substances that are currently evaluated are calcium carbonate and/or other material such as sulfates. By measuring and observe a small controlled volume of aerosols, the understanding of, *inter alia*, the processes that can reduce or eliminate ozone loss can be improved. However, the performance of the Second Phase is not subject to the Agreement with SSC and is yet to be decided – if it should at all be performed, and if so, where it will be performed - and this legal review will not address a review of the Second Phase (unless specifically mentioned).
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D. Required permits of SCC

We have been instructed: *To verify that SSC has all the necessary regulatory approvals and would be in compliance with Swedish laws in order to carry out the First Phase, limited to the testing of the navigation of one balloon to be launched over Sweden into the stratosphere.*

10. SSC requires the following permits related to First Phase for its operations³:
- Permit to fly unmanned free balloons in Sweden and permits for unmanned balloon flights through Finnish and Norwegian airspace
 - Permit to operate in restricted areas
 - Permit regarding radio communications

D.1 Permit to fly unmanned free balloons

11. General operational provisions for the launching of unmanned free balloons are found in the 1944 Chicago Convention on International Civil Aviation Rules according to the ICAO (International Civil Aviation Organization) Annex 2 - Rules of the Air, and according to Regulation (EU) No 923/2012 on Standardized European Rules of the Air (“SERA”), Annex 2, sections 2.1-2.5.
12. Section 2.1 of SERA prescribes that unmanned free balloon must not be operated without permit from the state from which the launch is made. The launching of an unmanned free balloon must not take place within Swedish territory without permit from the Swedish Transport Agency. Flights with balloons from Swedish territory into another country’s territory must not take place without a permit from the other country’s aviation authority.
13. SSC annually applies for permits to launch stratospheric balloons in Sweden to the Swedish Transport Agency. The most recent permit for 2021 (TSL 2020-7174) dated 13 November 2020 is referring to a certain programme including Project SCoPEX noting 1 – 30 June 2021 for one “*Heavy scientific balloon flight*” and that the air traffic control (ATS) shall be notified at latest seven days in advance of launch.
14. The reason for the permit is as follows (translated from Swedish): “*The requirements contained in Regulation (EC) No 923/2012 SERA (Standardized European Rules of the Air), Annex 2, section 2.1 prescribes that flying with an unmanned free balloon must not be commenced without permit from the state from which the launch is made.*”
15. The Swedish Transport Agency’s decision has gained legal force, which means that it cannot be appealed. Harvard does not have to apply for its own permit for the launch of the balloon in the First Phase. In addition, SSC holds relevant permits

³ It should be noted that SSC most likely hold several other permits that are not related to the First Phase of the SCoPEX project.

to fly unmanned balloons in both Norwegian and Finnish airspace between 1 January 2021 and 31 December 2021.⁴

D.2 Permit to operate in restricted areas

16. The operation of SSC is to a large extent governed by SERA. SERA is regulating common aircraft and operational provisions for services and procedures in air traffic. In accordance with SERA and chapter 1 section 4 in the Aviation Regulation (Sw. *Luftfartsförordningen* (2010:770)), the Swedish Transport Agency has authority to determine if an area should constitute a restricted area. A restricted area means that the airspace, due to for example safety reasons, becomes limited and restricted. The Swedish Transport Agency has decided that Estring shall be a restricted area and granted SSC permission to operate in the area.⁵

D.3 Permit regarding radio communications

17. The Electronic Communications Act (2003:389) (Sw. *lag om elektronisk kommunikation*), prescribes that the use of radio transmitters on aircrafts require a certain permit.⁶ The Swedish Post and Telecommunications Agency has confirmed that SSC has been granted such a permit.
18. Pursuant to 130 § in the regulation PTSFS 2020:5, Harvard does not need to apply for a permit when using an Iridium satellite phone instead of a transmitter. Harvard could operate under Iridium's license.

D.4 Safety laws and regulations etc. regarding Estring

D.4.1 Compliance to safety laws and regulations

19. SSC Proposal section 5.5.1 refers to that SSC must comply with Swedish law and Swedish safety and security regulations applying to all activities at Estring including the Work Environment Act (1977:1160) (Sw. *Arbetsmiljölagen*) which is the basic general law which defines the framework for provisions concerning occupational safety and health in Sweden. The purpose of the act is to prevent occupational illness and accidents and to otherwise ensure a good work environment.

D.4.2 Certain geographical safety regulations for Estring

20. The Administrative Board of Norrbotten County decides on safety regulations for the activities at Estring (Norrbotten County Statute Collection 25 FS 2020:29 A28). Such regulations are based on chapter 3 section 11 of the Public Order Act (1993:1617) (Sw. *Ordningsslagen*) and a decision by the Government of 30 June 1972. The safety regulations deal with the geographical security protection area outside Estring and information to the public, local authorities and reindeers

⁴ According the SSC SCoPEX 2021 proposal dated 9 December 2020, section 5.2, permits have also been granted by transport authorities in Norway and Finland. This has been verified by the provision of decisions of the Norwegian Civil Aviation Authority dated 13 November 2020 and the Finnish Transport and Communication Agency dated 20 November 2020, respectively.

⁵ The Transport Agency has confirmed this by email dated 8 February 2021.

⁶ Chapter 3 section 1 of the Electronic Communications Act. In accordance with the preparatory work to the Swedish Aviation Act, a balloon is included in the definition of an "aircraft", government bill 2009/2010 p. 293.



herders to stay out of the area in connection with launching etc. Non-compliance with the regulations may result in fines.

D.5 Conclusions

21. SCC holds the necessary permits to fly unmanned balloons in both Sweden, Norway and Finland. SSC has confirmed that it does not consider it necessary with a permit for any other country in respect of the Project.
 22. Harvard does not need to apply for a permit regarding radio communication equipment when using an Iridium satellite telephone instead of a radio transmitter. Harvard could operate under Iridium's license.
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E. Relevant legislation

We have been instructed to investigate: *As regards the First Phase, to which extent (i) Swedish environmental law and/or environmental EU directives and regulations are applicable, (ii) regulations on environmental impact assessments are applicable, and (iii) potential other relevant Swedish laws are applicable.*

E.1 Introduction

23. Below is a description of Swedish legislation that have been identified as relevant to the Project. It should be noted that the description does not aim to be exhaustive such to include *all* Swedish laws that could to some extent be applicable to the Project. The focus has been environmental laws and laws related to space or aviation.

E.2 The Space Act

24. Given the operation of SSC, the Swedish Space Act (1982:693) (Sw. *Rymdlagen*) (“Space Act”) and Space Ordinance (1982:1096) (Sw. *Rymdförordningen*) (“Space Ordinance”) should be mentioned. According to section 1 of the Space Act, the act is only applicable on operations in *outer space*. Since SSC does not operate in outer space, the Space Act and the Space Ordinance are not applicable.

25. However, it should be noted that the Swedish government on 2 April 2020 issued a committee directive proposing a review of the Swedish legislation on space activities (Sw. *rymdverksamhet*), which means that a special investigator shall review the Space Act and, if necessary, the adjacent space regulation. The purpose is to achieve a long-term sustainable regulation of space activities in line with international regulations and national security and which creates predictable and favorable conditions for companies, universities and authorities within the space field.⁷

26. Initially, the review were to be submitted to the Swedish Parliament by no later than 1 June 2021, however, the deadline has been extended to 17 September 2021.⁸ Once the review has completed, any suggestions will likely be subject to consultation process by which certain authorities and institutions may provide feedback. This means that any amendments to the regulation will not enter into force before the First Phase of the Project, which is expected to be carried out in June 2021.

⁷ The investigator shall *inter alia* (i) provide an opinion if the Space Act should include conditions to obtain a permit for space activities, and whether or not the state should be included in such permit requirement, (ii) examine whether it is appropriate to introduce provisions in the Space Act on the protection of the space environment and the prevention of the emerge of space debris (Sw. *rymdskrot*), (iii) in the review, take into account Sweden’s foreign security and defense interests as well as political interests and obligations under international law, and (iv) assess whether protection of Sweden’s security should be regulated in the Space Act.

⁸ <https://www.regeringen.se/pressmeddelanden/2020/09/rymdlagen-utreds--ny-utredare-blir-goran-lundahl/> (2021-02-04)

E.3 The Environmental Code

E.3.1 Environmental Impact Assessments

27. One of the main issues in respect of which we have been instructed to advise is if the Swedish regulation requires an environmental impact assessment for the First Phase. The main regulatory framework on Swedish Environmental law is the Environmental Code (1998:808) (Sw. *Miljöbalken*) (“the Code”) and chapter 6 of the Code deals with environmental impact assessments. This chapter was recently revised with the purpose to further align with the provisions on environmental impact assessments of EU law and certain international conventions.⁹ The revised version of chapter 6 entered into force in 2018.
28. The revised chapter 6 contains a clearer division of regulations on environmental impact assessments in respect of the planning and decisions on plans and programs (strategic environmental impact assessments) on the one hand, and actual operations and activities (specific environmental impact assessments) on the other hand.¹⁰ The First Phase of the Project is not a plan nor a program according to the Code but could be considered as *an activity*. Section 20 of chapter 6 of the Code stipulates which operations and activities requiring environmental impact assessment: (i) for a permit according to chapter 7 section 28a (referring to section 27) of the Code (regarding wild birds¹¹ and certain habitat for wild animals and plants¹²), or (ii) for a permit referred to in chapter 9 (environmentally hazardous activities), or (iii) chapter 11 (water activities) or that requires such permissibility (Sw. *tillåtlighet*) as referred to in chapter 17 (regarding general navigable waterways (Sw. *allmänna farleder*), geological storage of carbon dioxide and facilities for nuclear activities, if the activity or measure can be assumed to have a significant environmental impact.
29. It is clear that the First Phase of the Project does not include (i) and (iii) above, but it should be further investigated if such a requirement could be raised in relation to (ii) above (environmentally hazardous activities) or if it in any other manner constitutes an activity with a significant environmental impact (Sw. *betydande miljöpåverkan*).
30. Given that the First Phase of the Project only includes the launch and deflate of a test balloon and gondola that will be airborne for approximately four to six hours¹³, we do not consider that chapter 9 section 1 of the Code is applicable, and

⁹ UNECE Convention on Environmental Impact Assessment in a Transboundary Context (“the Espoo Convention”) (see Appendix 1, C) and its protocol, as well as the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (“the Aarhus Convention”) (see section Appendix 1, D).

¹⁰ Government bill 2016/17:200 p. 61.

¹¹ Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds.

¹² Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

¹³ Harvard SCoPEX Balloon Statement of Work Summary AD-1 referred to in SSC Proposal.

in conclusion that the potential implementation of the First Phase does not constitute an operation or activity requiring environmental impact assessment according to section 20 of chapter 6 of the Code.

31. There are also activities which fall within the scope of the EIA directive without being subject to a permit requirement under the Code. Such operations and activities are regulated by section 26a of the Ordinance on Environmentally Hazardous Activities and Health Protection (1999:899) (Sw. *förordningen om miljöfarlig verksamhet och hälsoskydd*). For the activities subject to notification that are listed in this ordinance, the responsible authority shall assess whether the activity needs to be subject to a permit process. Such assessment shall be made on the basis of the operations' or activities' environmental impact and the criteria in section 10-13 of the Environmental Assessment Ordinance (2017:966) (Sw. *miljöbedömningsförordningen*). The criteria in mentioned sections seek to establish if an operation involves a significant environmental impact (Sw. *betydande miljöpåverkan*). For example, section 10 states that a decision should take into consideration the operations' or activities' distinctive features, location and the type and characteristics of the possible environmental effects. Moreover, section 11 states that as regards the distinctive features, the operations' or activities' scope and design as well as if it contributes to cumulative environmental effects together with other operations, should be considered.
32. After having reviewed the criteria in section 10-13 for an activity that constitutes a significant environmental impact, our conclusion is that the First Phase of the Project does not fulfil these criteria, including not constituting an activity with significant environmental impact. Thus, an environmental impact assessment is not required for the First Phase of the Project.

E.4 The Civil Aviation Act

33. The Code interacts with other laws. For example, section 7 of chapter 1 of the Code refers to the Civil Aviation Act (2010:500) (Sw. *luftfartslagen*) in respect of environmentally worthiness of the aircraft.¹⁴ Following from section 1 and 4 of chapter 3 of the Civil Aviation Act, it may be required that an aircraft must be issued with a certificate of airworthiness and a certificate of compliance with environmental standards prior to being used for aviation. However, according to the Swedish Transport Agency, these licenses require that the balloon is registered in the aircraft register. Requirements for registration are primarily placed on other types of manned aircraft than balloons.¹⁵ In light of this, it is not a requirement that Harvard obtain any of these licenses to use the balloon.

¹⁵ Cf. Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, the Civil Aviation Act, the ordinance (1986:172) regarding the aircraft register and TSFS 2016:40.



E.5 EU regulations and international conventions regarding the environment ratified by Sweden

34. Since 1995, Sweden is a member of the EU. As environmental matters are typically cross-border issues, Swedish environmental laws are, with few exceptions, strongly influenced by EU law. As a result, EU regulations is to a large extent implemented into and thus become part of Swedish law. However, an overview of certain EU regulations and international conventions ratified by Sweden with regards to, inter alia, environmental impact assessment, transboundary impact assessments, right to legal access etc., as well as the relevant implementations into Swedish law are described in [Appendix 1](#).

E.6 Conclusions

35. The Space Act is not applicable on the First Phase of the Project. There is no requirement that Harvard obtain a license for the balloon and gondola according to the Civil Aviation Act and consequential legislation.
36. The Code is also not applicable on the First Phase of the Project, as there are no environmental impacts such as emissions to air or water. Moreover, the waste such as plastics from the parachute of the gondola or the balloon itself is limited and will be salvaged either by SSC or by partners of SSC. Accordingly, no waste from the First Phase triggers any particular requirements or obligations under the Code. Therefore, it is our conclusion that an environmental impact assessment is not required with regards to the First Phase of the Project.
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F. Impact on the First Phase due to the potential implementation of the Second Phase

We have been instructed: *To address whether the potential implementation of the Second Phase of the SCoPEX project including release of material into the stratosphere would in any way affect the conclusions related to the questions in respect of the First Phase.*

37. Section E.3.1 describes under which circumstances an “operation or activity” requires an environmental impact assessment to be established. As there are no hazardous environmental consequences from the First Phase, we have concluded that such an environmental impact assessment is not required for the First Phase of the Project. Although it is noted in the preparatory works to the Code and in Swedish case law that an assessment should include *all parts* of the operation or activity, not only the part requiring a permit, such assessment is limited to the activity at hand.¹⁶ This means that the “project as a whole” should be taken into account, which in our case is the whole of the First Phase.
38. This interpretation is in line with the principles in the Swedish Public Administration Act (2017:900) (Sw. *Förvaltningslagen*), the Administrative Procedure Act (1971:291) (Sw. *Förvaltningsprocesslagen*) and general principles of administrative process. For example, a trial or assessment can typically only cover what the applicant has applied for or intend to do. Only the applicant is in control of the application. Thus, the scope of the trial, application, notification or assessment is limited to the matter at hand.
39. Consequently, in relation to an application for a defined action, as one part of a planned operation, the possible forthcoming actions or further processes if not part of the application cannot be subject to the process as they fall outside the admissible scope. A consequence of this is that any opinions from the public or other authorities can only be considered if falling within the scope of what is being applied for or evaluated. Potential future actions cannot be considered.
40. In conclusion, since the First Phase and the Second Phase are separate independent phases, the First Phase will not be affected by the Second Phase. Accordingly, the assessment of applicable laws and regulations in the First Phase does not affect the fact that SCoPEX may include a later, separate Second Phase.¹⁷

¹⁶ Government bill 2016/17:200 p. 195 and case no. MÖD 2007:50

¹⁷ It should also be noted that the Agreement (between SSC and Harvard) relates only to First Phase.



Stockholm 18 February 2021

Håkan Fohlin

Tove Skärblom

Appendix 1:

Overview of certain EU regulations and international conventions ratified by Sweden

Appendix 1

Overview of selected EU regulations and international conventions on the environment ratified by Sweden

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Introduction

1. The Project relates to solar radiation management (“**SRM**”) and in particular stratospheric aerosol injection. SRM is not regulated by any specific international agreement or convention. Although Sweden and the EU are parties to a number of international treaties concerning geoengineering generally, none are dealing with SRM in particular. However, with regards to cross-border impact risks there are international agreements on environmental protection which could be applicable, for example in relation to air pollution control and species and habitat conservation, depending on the nature, size and location of the activities.¹⁸
2. Below is a summary of EU regulations and international treaties that could be relevant in relation to solar radiation management, with focus on environmental impact assessments. We have reviewed and considered these regulations and treaties in respect of First Phase and concluded that, in our opinion, none are applicable on First Phase.

B. Precautionary Principle

3. Pursuant to Article 191 of the Treaty on the Functioning of the European Union, Union policy on the environment “*is based on the precautionary principle and on the principles that preventive action should be taken ... Effects on the environment should be taken into account at the earliest possible stage in all the technical planning and decision-making processes.*” The principle is also referred to in a number of international treaties as well as in Swedish national law.¹⁹ It is common for environmental organizations to refer to the Precautionary Principle, not always as a legal but more of a universal principle to act cautiously.
4. The First Phase does not cause any environmental impact but is merely a test of the navigation system of the balloon. In our opinion there is no relevant environmental caution to be exercised and references to the precautionary principle is irrelevant.

C. Procedural regulations on environmental impact assessment

C.1 Espoo Convention

5. Sweden and EU have ratified the 1991 Espoo Convention on environmental impact assessment in a transboundary context (“**Espoo Convention**”), including its amendments and protocols.²⁰ The Espoo Convention recognizes that operations in one country can have environmental effects in other countries, and coop-

¹⁸ Cf. Shepherd J et al. 2009 Geoengineering the climate: science, governance and uncertainty. London, UK: The Royal Society. Page 40. See <https://royalsociety.org/topics-policy/publications/2009/geoengineering-climate/>

¹⁹ For example, the Rio Declaration and Chapter 2 section 3 of the Code.

²⁰ <https://www.naturvardsverket.se/Miljoarbete-i-samhallet/EU-och-internationellt/Internationellt-miljoarbete/miljokonventioner/Esbokonventionen/> (2021-02-05)

eration around these issues is crucial. Operations that have significant environmental cross-border impact should, as much as possible, be avoided.²¹ It also sets out the general obligation of states to notify and consult each other on all major projects under consideration that are likely to have significant adverse cross-border environmental effects. Under Swedish law, this is reflected in section 34 of chapter 6 of the Code.

6. In our opinion the First Phase does not have any environmental impact and as a result the Espoo Convention is not applicable.

C.2 Aarhus Convention

7. The 1998 Aarhus Convention on Access to Information, Public Participation and Decision-making and Access to Justice in Environmental Matters (“**Aarhus Convention**”) has been ratified by EU and Sweden. As the title suggests, the Aarhus Convention grants rights to the public on access to environmental information, public participation in environmental decision-making and access to justice on matters concerning the local, national and transboundary environment. It focuses on relations between the public and state authorities.
8. Prior to the introduction of the Code, environmental organizations in Sweden had limited rights to appeal decisions unless they were immediately affected. With the Code entering into force in 1999, environmental organizations received extended rights to appeal decisions on environmental matters. This was essentially an implementation of article 9(2) of the Aarhus Convention into Swedish law.²²
9. In the Code, this is reflected in section 13 of chapter 16, from which follows that environmental organizations have a right to appeal decisions on permits, permissions and exemptions issued under the Code. To be entitled to appeal, the organization must be a non-profit organization that has been active in Sweden for at least three years, have no less than 100 members (or that may otherwise prove it has public support) etc. In recent case law, environmental organizations have also to some extent been allowed to appeal permits, permissions and exemptions that have been issued under law other than the Code. These rights have been established under the Administrative Procedure Act (Sw. *Förvaltningslagen*), interpreted *in the light* of the Aarhus Convention. As a result, environmental organizations enjoy further extended rights to appeal environmental matters, for example decisions on concessions issued under the Swedish Electricity Act (1997:857) (Sw. *ellagen*).
10. At this point, the launch of the balloon and gondola is not subject to any law requiring a decision in respect of a permit for Harvard. Moreover, in our opinion the First Phase will not have any environmental impact. The potential implementation of the First Phase will not result in any decision by court or authority on which the Code or the Aarhus Convention will be applicable.

²¹ Government bill 2016/17:200 p. 59.

²² Government bill. 1997/98:45 s 488.

C.3 The International Court of Justice

11. The International Court of Justice (“ICJ”), to which all members of the UN are subject, has established by case law a requirement on states to carry out due diligence on projects with environmental cross-border impact.²³ This also applies in respect of SRM. The ICJ recognized that the accepted practice amongst states amounted to “a requirement under general international law to undertake an environmental impact assessment where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context, in particular, on a shared resource.” It is argued that the ICJ judgment implies that states have a duty to notify and consult with potentially effected other states.²⁴
12. Because First Phase in our opinion does not have any environmental impact, and even less so any cross-border impact, the ICJ case law is not applicable.

D. Regulations on Environmental Impact Assessments

13. With regards to environmental impact assessments for operations or activities, the main EU legislation is the EIA Directive²⁵. The directive contains provisions to ensure a systematic assessment is carried out for projects which, due to their nature, size or location, entail a significant environmental impact.²⁶ This applies to a wide range of public and private projects, which are defined in Annexes I and II of the directive. All projects listed in Annex I are deemed having significant effects on the environment and require an environmental impact assessment, for example long-distance railway lines, airports and installations for the disposal of hazardous waste. In Sweden this corresponds to activities that require a permit under Chapter 9 (environmentally hazardous activities), Chapter 11 (water activities) and related sectorial legislation (Sw. *sektorslagstiftning*), for example roads and railways.
14. For projects listed in Annex II, it is up to the national authorities to decide whether an environmental impact assessment is required or not. This is done by a certain screening procedure, which determines the effects of projects on the basis of certain thresholds/criteria or on a case-by-case assessment. However, the national authorities must take into account the criteria laid down in Annex III.²⁷

²³ ICJ Judgement of 20 April 2010 Pulp Mills on the River Uruguay (Argentina v. Uruguay)

²⁴ Bodansky D. 2019 Solar geoengineering and international law. In *Governance of the deployment of solar geoengineering* (eds RN Stavins, RC Stowe), page 121. Cambridge, MA: Harvard Project on Climate Agreements. See <https://www.belfercenter.org/publication/governance-deployment-solar-geoengineering> (2021-02-11).

²⁵ Directive 2011/92/EU of 13 December 2011. The first directive 85/337/EEC on environmental impact assessments entered into force in 1985.²⁵ This directive has been amended three times, in 1997, 2003 and 2009. The EIA Directive of 2011 is a codification of the directive of 1985 and its amendments. The EIA Directive has in turn been amended in 2014 by directive 2014/52/EU.

²⁶ The EIA Directive was aligned with the Espoo Convention through the amendment 97/11/EC of the EIA Directive, which broadened the scope of the EIA Directive by increasing the type of projects covered and the number of projects requiring mandatory environmental impact assessments.

²⁷ <https://ec.europa.eu/environment/eia/eia-legalcontext.htm> (2021-02-03)

15. The First Phase does not qualify as an operation or activity under any of Annex I, II or III of the EIA Directive. As there are no environmental impacts from the First Phase, the EIA Directive is in our opinion not applicable.

E. Convention on Biological Diversity

16. Of special interest is the 1992 Convention on Biological Diversity (“**CBD**”) including Sweden and the EU, which in 2010 issued a non-binding decision²⁸, a moratorium, allowing exemptions for small scale scientific research studies²⁹;

“that no climate-related geo-engineering activities that may affect biodiversity take place, until there is an adequate scientific basis on which to justify such activities and appropriate consideration of the associated risks for the environment and biodiversity and associated social, economic and cultural impacts, with the exception of small scale scientific research studies that would be conducted in a controlled setting in accordance with Article 3³⁰ of the Convention, and only if they are justified by the need to gather specific scientific data and are subject to a thorough prior assessment of the potential impacts on the environment.”³¹

17. As stated previously, in our opinion the CBD is not applicable on First Phase. However, even if the CBD would be applicable, there is an exception for small scale scientific research studies. The First Phase would qualify as such an exception.

F. Summary

18. There is no international agreement or treaty comparable to the UNCLOS that governs the atmosphere. States have sovereignty over the air space above their territory, from the ground to where the outer space commences.³² Consequently, the injection of aerosols is subject to the jurisdiction and control of the state in whose air space it is injected into.³³

19. However, the obligation not to cause significant transboundary harm is recognized in many international treaties, such as CBD, the Espoo Convention and also in Swedish national law. In general, states are not allowed to conduct or permit activities within their territory, or in common spaces such as the high

²⁸ COP 10 Decision X/33 and confirmed 2016 COP 13.

²⁹ The Project SCoPEX website www.keutschgroup.com/scopex, page 9, refers to that SCoPEX Second Phase does not violate CBD due to the small scale scientific test.

³⁰ Article 3 states that “States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.”

³¹ It could be noted that the Swedish preparatory work SOU 2020:4 (January 2020) “The pathway to a climate-positive future – strategy and action plan for achieving negative greenhouse gas emissions after 2045” is not addressing SRM specifically but states on page 103: “Sweden should work to ensure that the decision on the moratorium on geoengineering made at the Tenth meeting of the Conference of the Parties to the Convention on Biological Diversity in Nagoya is amended such that bio-CCS and other non-fossil CCS are not covered by the moratorium.”

³² The precise point where this limit is reached is not entirely settled as a matter of law, [https://royalsociety.org/topics-policy/publications/2009/geoengineering-climate/see Shepherd J et al. page 40. \(2021-02-11\)](https://royalsociety.org/topics-policy/publications/2009/geoengineering-climate/see%20Shepherd%20J%20et%20al.%20page%2040.%20(2021-02-11))

³³ Shepherd J et al. page 40.



seas and up to outer space, without considering the interests of other states and the protection of the global environment. Consequently, states are obliged to exercise due diligence in regulating activities under their jurisdiction and control. If an operation or activity have cross-border implications, or is located beyond national jurisdiction (for example space-based techniques for reducing solar radiation) international cooperation on regulation will be necessary.³⁴

20. However, the First Phase does not include any environmental harm and does not have any environmental cross-border impacts. Thus, our conclusion is that the regulations and conventions referred to in this appendix are not applicable to the First Phase of the Project.

³⁴ Shepherd J et al. Page 40.