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Swiss Space Policy

Summary of the expert hearings

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Abbreviations and acronyms

CHEOPS	CHaracterising ExOPlanet Satellite
EAER	Federal Department of Economic Affairs, Education and Research
ESA	European Space Agency
EU	European Union
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
ICBM	Intercontinental Ballistic Missile
NTN	National Thematic Network
Q&A	Question and Answer
RPC	Res Publica Consulting
SWOT	Strength, Weakness, Opportunity, and Threat
UN	United Nations
VC	Venture Capital

1 Introduction

1.1 Background

The Swiss Space Policy currently in force was adopted by the Federal Council in 2008. Since then, space activities have developed significantly at global, European and national level. Thus, the Federal Council decided in February 2022 to revise the national space policy. The revision is being led by the Federal Department of Economic Affairs, Education and Research (EAER), supported by an interdepartmental Working Group.

1.2 Expert hearings

The revised Swiss Space Policy will partly be based on the results of an on-going evaluation of the existing policy. In the context of this evaluation, a SWOT analysis was carried out. From this analysis, questions were derived that will have to be answered for establishing the revised space policy (see Annex 1).

A small number of national and international experts were invited to address these questions in the form of a hearing (see annex 2). The experts provided answers to the questionnaire or a subset thereof, followed by a Q&A session, whereas questions were asked by the members of the above-mentioned Working Group and the Interdepartmental Coordination Committee for Space Affairs. The hearings took place on 12/13 April 2022 in the form of a video conference. They were moderated by either the chair or a member of the Working Group.

This summary document was prepared by the project team, consisting of collaborators of the Swiss Space Office, supported by an external consultant. When summarizing the experts' statements, the specific area of expertise of each individual was taken into account, as well as the fact that most experts concentrated on addressing on a selection of the presented questions and did not comment on topics outside their field of expertise. The present document was approved by all experts.

This summary document now serves as a basis for the Working Group to answer the corresponding questions in the development of the revised Swiss Space Policy.

2 Hearing results

2.1 Switzerland's role in space

Question 1: How do you see Switzerland's role in space?

In answering question 1, experts addressed the following three aspects:

- Switzerland does and should continue to play an active role in policy development and governance in European and global organizations. At the global level, Switzerland should leverage on its neutrality and thus contribute to solving global problems, e.g. by fostering discussions among states, and the development of legal instruments aiming at responsible behaviour of public and private space actors. One expert mentioned that Switzerland - in its capacity as a “space middle power” - is well positioned to build bridges between major space fairing nations, but also between major space powers and emerging space nations.
- At European level, Switzerland should continue contributing to the further development of a European space policy and also to provide key elements to European space programmes, e.g. in the area of European autonomous access to space.
- On the operational level, experts noted the necessity of an active participation in the governing bodies of the organisations where Switzerland is a member of, to ensure that Swiss actors have access to all programmes and Switzerland can maintain its leading position in selected areas, and also its diversity of products and services.

2.2 Niche policy

Question 2: Should the Swiss Space Policy aim to focus on selected topics and thus specialize in specific niches? If so, which topics should these be?

Most experts agreed that Switzerland should focus on selected topics. One international expert emphasised the strength of the Swiss bottom-up approach and the importance to continue to drive the country’s diversity of activities to multiply the chances of success. The same expert further recommended strengthening the synergies between all actors to increase efficiency in line within the bottom-up approach (diversity does not mean dispersion).

One expert pointed out that when selecting topics, care should be taken to ensure that Switzerland already has something to offer in this particular area and likewise that in addition to industrial competences, the state must also be credible in the relevant field. Furthermore, a narrative should be developed to explain citizens and decision makers why the corresponding priorities have been selected.

Another expert emphasised the importance of the necessary political determination to actually want to reach an internationally leading role in the selected thematic areas. Linked to this determination is the need not to undercut excellence and thus to concentrate the available resources on the selected focus themes where Switzerland is leading.

2.3 Flagships

Question 3: What commitment to "flagships" (individuals or projects such as the Swiss-led ESA science mission CHEOPS) makes sense to ensure political and public support for space policy and to motivate young talent?

The usefulness of flagships is explicitly recognised. The experts pointed to two components:

- Flagships are central for communication. Space activities are usually only perceived by the general public and politicians thanks to flagship projects, not through technologically competitive components. One expert also explicitly pointed out the international impact of flagship projects.
- As a second aspect that was mentioned, also in association with the high quality of the Swiss education, research and innovation system, was the central function of flagships for motivating young talents and the associated educational impact.

2.4 Know-how transfer

Question 4: What measures can be taken to make better economic use of the know-how generated in science?

The experts acknowledged that the transfer of know-how from science to industry is important. The space domain was flagged as a sector where cooperation between academia and industry is particularly intense. In the case of start-ups, the transfer usually works well because such young companies still have close connections to a university. However, the situation is often different for other companies, especially established smaller firms. The experts formulated the following suggestions to improve the situation: use of national networks (e.g. NTNs of Innosuisse), involvement of associations representing economic actors as relay station between research institutes and companies, involvement of lawyers for the purpose of clear regulation of IPR issues, reduction of bureaucracy.

One expert mentioned various models for how newly developed technologies can be transformed into the private sector, such as grants, service contracts, space agency as anchor customer. Another expert stated that the know-how creators should be rewarded, ideally with generous funding. Finally, one expert pointed out the rule in Switzerland that the industrial share in scientific space projects must be 50 %; this rule should be maintained.

2.5 Switzerland's position in the European space landscape

Question 5: How do you assess the opportunities and risks of the European Union's increasing role in European space activities and the associated increase in political influence on intergovernmental organizations such as ESA or EUMETSAT? How should Switzerland position itself with a view to the future?

The increasing role of the European Union (EU) in space activities is clearly seen as an asset for Europe, because the EU's engagement in space allows to closely link

space with various sectoral policies such as environment, transport, agricultures, security, etc. But also, the EU's increasing role is seen as a challenge for Switzerland. As a consequence, and mentioned by several experts, Switzerland should aim for an early and comprehensive participation in all European programmes, including political, diplomatic and financial engagement as well as industrial participation with key elements. In this context, one of the experts recommended that the national decision-making processes for participation in EU programmes urgently need to be revised, so that in the future such decisions can be taken more quickly and gaps between participation in the development phase and the operational phase can be prevented. Switzerland should thus avoid a loss of opportunity for industry and decrease the dependency from foreign political pressure by positioning itself early with indispensable contributions. The EU Secure Connectivity Programme was highlighted by a national expert as the next flagship programme to consider joining.

In addition to participation in European programmes, the experts recommended striving for the greatest possible diversity. This can be achieved through bilateral cooperation in Europe or cooperation with non-European space agencies, and also by creating favourable conditions for Swiss companies to participate in the growing private space market.

2.6 Security and defence

Question 6: Security and defence: In which application and technology areas do you see opportunities for the Swiss Armed Forces to collaborate in space (nationally/internationally, governmental/industrial)?

The growing significance of space with respect to security policy was noted by several experts. It was mentioned that space is either directly or indirectly related to all forms of security - military, food, water, energy, or climate. One expert pointed out that humanity is about to inhabit space more and more, and thus space becomes a place where international relations of power might develop; this will inevitably induce the development of parallel security and defence activities. Additionally, modern societies depend more and more on space applications and thus space infrastructure is counted as critical infrastructure. It must therefore be protected. It was also pointed out that national space forces are being established in several countries, also in Europe, and that the number of anti-satellite tests and experiments for space operations is increasing.

One expert highlighted the ongoing geopolitical shifts in the 21st century into a multipolar world with various regional superpowers. Another expert pointed out that space has evolved from a domain of strategic intelligence into a theatre/combatant domain. Yet another expert pointed out that in the technology domain the differentiation between military and civil security is becoming increasingly difficult due to the dual-use nature of these technologies.

One expert mentioned the so far fruitless international efforts for a new international treaty that could help prevent - or at least control - military activities in space. He suggested using the example of the Hague Code of Conduct in the area of ICBM to develop something similar for space; Switzerland could take an active role in such endeavour.

Another expert addressed the possibility of Switzerland developing satellites for its own security purposes (e.g., secure communication, Earth observation), both for civilian and military use, either alone or in cooperation with other states. He pointed out that the purpose of such an undertaking must be determined by nothing else but national interests.

2.7 Risks and dangers

Question 7: What risks and dangers in/from space do you see against which Switzerland should prepare itself?

The experts see risks and dangers mainly in three areas:

- Manmade hazards: Several experts consider the growing number of debris to be the greatest challenge. A solution for Space Traffic Management can only be found globally. However, Switzerland can contribute to a solution through awareness raising and capacity building at home and abroad, as well as by involving the private sector, which contributes significantly to the emergence of this challenge. One expert suggested that the Long Term Sustainability Guidelines should be translated into the national legislation. Two experts said that guidelines were not binding enough. They should be replaced by legally binding rules.
- Natural hazards: One of the experts pointed to Switzerland's existing capacities in the area of space weather and planetary defence and suggested that Switzerland could get involved internationally in this area.
- Cyber: One of the experts explained how the increasing use of space for data acquisition, transmission and archiving is also increasing cyber risks. He also pointed out that hardly any information was available on cyber incidents affecting the space economy, making it difficult to discuss and jointly develop defence measures.

2.8 Switzerland’s role in global space governance

Question 8: How do you see Switzerland's role in global space governance?

In addition to the active role of Switzerland in the governance bodies of international organisations mentioned in answering question 1, the following specific points were also mentioned:

- One of the experts pointed out that Switzerland has managed, thanks to excellent representatives from the federal administration, universities as well as economy, to gain a lot of influence in international bodies. Switzerland should continue to contribute with its good services but also through an active positioning and personal engagement of individuals in the governance bodies of international organisations.
- One expert suggested that, in order to solve the debris problem, Switzerland could create an informal platform involving those actors who generate the highest number of debris, in particular the USA and China.
- Another expert suggested that Switzerland could get involved in the development of a code of conduct for transparency and responsible behaviour in

space, comparable to the Hague Code of Conduct (see also answers to question 6).

- In addition, one expert was of the opinion that Switzerland should defend multilateralism and get involved in preventing uncontrolled colonisation of space - or certain orbital areas, and could also advocate for planetary ethics or provide support for countries that do not yet have space assets of their own.
- One expert recalled the neutrality as opportunity and suggested that Switzerland could take a key role in supporting and underscoring values of openness, transparency, sharing of data and commitment to norms.

2.9 Start-up financing

Question 9: Do you consider a national program to promote venture capital financing for start-ups to be appropriate or even necessary?

The answers to this question varied. Some experts support VC funding unconditionally while stating that state investments are equally important. One expert pointed out that, thanks to new methods developed by start-ups, space activities have become much cheaper today than they were just a few years ago. This development challenged established companies and forced them to make significant cost reductions.

One of the experts did not fundamentally reject VC funding; however, he clearly pointed out that many long-time established companies can be considered as “multiple-time start-ups” because they are often uniquely positioned in a niche and have repeatedly innovated their products and processes over time. The same expert also said that in Switzerland the problem for start-ups is not so much raising venture capital, but rather the financing of the subsequent industrialisation phase.

Another expert stressed the importance of VC funding being success-oriented. This means that a few players should be supported with a lot of money, which is not always easy depending on the political environment.

2.10 Impact measurement

Question 10: How do you see effective and efficient impact measurement? Which indicators show that Switzerland's policy is successful?

The experts agreed that this was a difficult question for outsiders to answer. One expert suggested that indicators should be defined iteratively, with a Swiss expert group developing an initial proposal that could then be discussed with external experts.

Despite the difficulty of the question, the experts made some concrete proposals, for economic, technological, social, security and environmental indicators, both quantitative and qualitative.

In this context, one of the experts has also strongly recommended to undertake comprehensive business research (supply chains, IPR regimes, economic impact, etc.).

2.11 Further trends

Question 11: Which other trends are relevant for Switzerland, which are not? What should Switzerland not do in the context of its space policy?

The experts agreed that Swiss space policy can only be seen in the context of international developments. Accordingly, they named the following trends that also have direct and indirect implications for Switzerland:

- the re-launched human exploration efforts towards the Moon;
- the exploration, exploitation and utilisation of space resources and associated legal challenges;
- the vital role of private companies - in parallel to government agencies - in space exploration and utilisation;
- the militarisation of space;
- the question of future autonomy of Europe in space;
- the sustainable use of space in view of the mega-constellations that are currently being built up and the increasing need for a globally coordinated space traffic management.

2.12 Additional elements

In their comments on the questionnaire and during the Q&A parts of the hearings, the experts also addressed aspects that are not directly related to questions 1-11 but are nevertheless relevant for updating the space policy. These elements are summarized here below.

Economic impact

Two experts pointed out that the space sector contributes to create attractive jobs (directly and via spill-over effects) and pointed out that with the excellence of university education and the high skill level of the labour force a beneficial impact is created for the Swiss society. One expert emphasised that sufficient public funds for the space sector are essential, but also recalled the positive return of the space industry regarding tax returns, in particular in rural regions.

Communication and outreach

One expert pointed out that citizens hardly know what their tax money is spent for, and what benefits space activities brings for them. He therefore recommended strengthening communication and outreach.

Commercialisation and NewSpace

The growing importance of the private sector was mentioned by all experts. Space is becoming a commodity, space-based infrastructures are being integrated with ground-based infrastructures, especially in the information sector, and the corre-

sponding business strategies therefore extend far beyond the space sector. One expert highlighted that the emergence of new private players ("NewSpace") is not a coincidence, but is related to governments/states wanting to rely on space development to meet their own needs for data acquisition, transmission, processing, and dissemination in defence and security, among others. Even if these NewSpace activities are shaped by private actors, it was noted by the experts that the basis for this development is thus created by the public authorities, which with their investments set the whole development in motion.

In contrast to the dominance of the public sector in the past, space will be dominated by private actors in the future. It is therefore important, said one expert, that the policy is designed to take this reality into account and to prevent "the Wild West" from entering space.

A national expert pointed out the need for Switzerland to provide public funding, especially to ESA, as well as support for entering future markets.

Space Traffic Management

In response to the question of whether a global solution can be expected in the area of Space Traffic Management, similar to that in civil aviation, the expert was rather sceptical about a globally binding solution in the near future. Regarding the role of Switzerland, it was said that Switzerland could strengthen its credibility if it implemented its international obligations in national legislation.

National space governance

One national expert suggested to strengthen space policy and its implementation at the federal level, through e.g. strengthening interdepartmental coordination of space affairs.

National legislation

In response to the question of how to deal with the conflicting interests when drawing up a national legal framework (clean orbits that can be used in the long term vs. as few constraints as possible for the space companies), the expert said that the main thing was to give the companies legal certainty.

Sustainability

Several experts addressed the importance of keeping all orbital regions clean to ensure their long-term, sustainable and safe use. Likewise, it was pointed out several times that space activities should contribute to the sustainable use of resources on Earth.

National space agency

One expert suggested reflecting about how Switzerland could coordinate its space activities even better. As an example, he mentioned a national space agency to bring in a new dynamic in terms of communication and organisation. Another expert said

that an agency should not be an objective in itself, but rather a tool to achieve space policy objectives. The expert advised against simply copying existing agencies, in particular as Switzerland has already a lot of tools, some of which used in combination with Switzerland's membership to ESA are very efficient.

Science and exploration

Despite the rapidly increasing importance of commercial and security-related activities, human curiosity, and thus science and exploration, remains an important driver for activities in space, according to one of the experts.

Talent development

One expert emphasized the crucial importance of fostering outstanding young talent for an industry that wants to be a global leader. Therefore, it is important that talents have a promising perspective, both in universities and in industry.

Annex 1: Questionnaire

1. How do you see Switzerland's role in space?
2. Should the Swiss Space Policy aim to focus on selected topics and thus specialize in specific niches? If so, which topics should these be?
3. What commitment to "flagships" (individuals or projects such as the Swiss-led ESA science mission CHEOPS) makes sense to ensure political and public support for space policy and to motivate young talent?
4. What measures can be taken to make better economic use of the know-how generated in science?
5. How do you assess the opportunities and risks of the European Union's increasing role in European space activities and the associated increase in political influence on intergovernmental organizations such as ESA or EUMETSAT? How should Switzerland position itself with a view to the future?
6. Security and defence: In which application and technology areas do you see opportunities for the Swiss Armed Forces to collaborate in space (nationally/internationally, governmental/industrial)?
7. What risks and dangers in/from space do you see against which Switzerland should prepare itself?
8. How do you see Switzerland's role in global space governance?
9. Do you consider a national program to promote venture capital financing for start-ups to be appropriate or even necessary?
10. How do you see effective and efficient impact measurement? Which indicators show that Switzerland's policy is successful?
11. Which other trends are relevant for Switzerland, which are not? What should Switzerland not do in the context of its space policy?

Annex 2: Hearing participants

Experts (in alphabetical order)

Stefan BRUPBACHER
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Interdepartmental Working Group for the revision of the Swiss Space Policy

Interdepartmental Coordination Committee for Space Affairs