**Comment from Canadian Friends Service Committee**

**on the Updated Report and Synthesis of Views of the Ad Hoc Technical Expert Group on Synthetic Biology, Montreal, Canada, 21-25 September, 2015**

Canadian Friends Service Committee (CFSC) thanks the Convention on Biological Diversity (CBD), the Parties, and CBD staff for taking on the vitally important subject of synthetic biology. As a civil society participant in the AHTEG process we at CFSC express our appreciation for the opportunity to comment on the AHTEG report.

What follows are:

A brief description of CFSC,

How CFSC’s interest in synthetic biology developed,

Comment on the AHTEG’s process and agenda (organization of work),

Comment on the AHTEG report and synthesis,

Further considerations, and

Recommendations

1. CFSC — CFSC is the peace, social justice and international development arm of Quakers in Canada. The Religious Society of Friends (Quakers) arose in 17th century England, believing that there is an Inner Light or “that of God” in every human being. Flowing out of this principle comes Quakers’ commitment to equality, peace, simplicity, community, integrity and stewardship (of life). Quakers across the world have been deeply engaged in addressing slavery, women’s rights, prison reform, mental health care, the human rights of Indigenous Peoples and other issues of social and ecological justice.

2. CFSC and synthetic biology — Canadian Quakers have had an active interest in the spiritual, ethical, and legal aspects of biotechnology since 2000 when we joined the Canadian Council of Churches’ Biotechnology Reference Group (BRG) as intervenors in a case before the Supreme Court of Canada related to the patenting of Harvard University’s *oncomouse* (which was not granted a patent). In 2012, the BRG was one of the hundred non-governmental organizations that endorsed the *Principles for the Oversight of Synthetic Biology.*

In early 2012, the World Conference of Friends (Quakers) issued a statement with strong ecological and social imperatives, *The Kabarak Call for Peace and Ecojustice*. It presaged the 2015 encyclical of Pope Francis, *On Care for Our Common Home*. This Quaker statement included, “…we must become careful stewards of all life,” and, “We are called to teach our children right relationship, to live in harmony with each other and all living beings in the earth, waters and sky…” The 2012 Yearly (national) Meeting of Canadian Quakers decided to engage Quaker meetings across the country to form a Quaker perspective on synthetic biology.

What are the implications of key Quaker values for our approach to synthetic biology?

*Equality* leads to fair sharing of opportunity, and so to fair sharing of synthetic biology’s benefits and costs, direct and indirect, across peoples and nations.

*Peace* implies avoiding military and violent uses of synthetic biology whether by nations, groups, or individuals.

*Simplicity* means keeping to basics, not drawing down resources – ecological, human, or financial – when simpler ways are available.

*Community* implies that peoples of all kinds, Indigenous and non-Indigenous, collaborate in planning, managing and benefitting from synthetic biology.

*Integrity* implies full and informative communication and consistency between words and action. Integrity also calls on synthetic biology to respect the complexity of life, to consider all levels, from the molecular to the ecosystem, to the societal.

*Stewardship* means prudent care: of ecosystems, of people, of their valued objects and of culturally-valued traditions.

3. Comment on the AHTEG process and agenda — The specifics for the AHTEG agenda derive from Convention on Biological Diversity Conference of the Parties (CBD COP) XII/24 in 2014, which recognized synthetic biology (SB) to be a new and emerging issue.

We at CFSC value the diversity of the AHTEG: governmental representatives from all regions of the world, SB researchers, civil society organizations with varied interests in SB, and SB industry representatives. CBD COP XII/24 asked for “representation of indigenous and local communities and all relevant stakeholders.” Unfortunately, neither Indigenous representatives nor stakeholders from communities potentially affected by SB participated in the AHTEG.

The agenda included broad topics—the relationship of SB and biological diversity; potential risks and benefits of SB to biodiversity, human health, and socioeconomic conditions; adequacy of national, regional, and international instruments to regulate SB; whether “existing arrangements” are a comprehensive framework to address the impacts of SB relevant to the CBD, especially loss of biological diversity. This gave the AHTEG much scope to address SB, but was an immense amount to cover.

The agenda also included challenging narrower topics: potential conflicts with the Cartagena Protocol; operational definition of SB; best practices of risk assessment and monitoring regimes. Any one of these subjects could have been a one-week conference.

Given the early stage of development of SB, its rapid development, its scientific uncertainties, its uncertain and potentially severe risks, the huge range of applications and therefore of interested parties, and many other factors, finding consensus on issues would be difficult for any group of this size.

4. Comment on the AHTEG Report and Synthesis — Re ¶s 11, 12, 14, 17: The report makes clear the divergent views with respect to risks and risk assessment needs and gaps. We reaffirm that synthetic biology (SB) includes such powerful techniques, and is evolving so rapidly, that assessment based on past experience would not seem to capture key issues. Among many others, Craig Holdrege[[1]](#footnote-1) has provided compelling evidence about the profound uncertainty and lack of predictability of SB.

We are pleased with the note at ¶ 55 of the AHTEG's recommendation to collect best practices related to risk assessment. CFSC's values of *stewardship*, *community*, and *integrity* lead us to recommend a proactive form of assessment of SB: what social scientists with extensive work in technology assessment call “anticipatory governance”,[[2]](#footnote-2) “real-time technology assessment”,[[3]](#footnote-3) “the art of governance”,[[4]](#footnote-4) and “keeping it complex”.[[5]](#footnote-5) These anticipatory approaches appear to fit well with the unknowns, uncertainties, and biological, social, ecological, economic, and political complexities of SB. They offer methods to track, forecast and manage this unpredictable and powerful field. Much of the research is evidence-based, having dealt with technological assessment in multiple fields.

Moreover, the proactive approach cited above can focus on sustainability, a subject very pertinent to the CBD but one which has received little attention in published reviews of SB.[[6]](#footnote-6) It also appears to us that this anticipatory approach, done systematically, offers a tangible means of operationalizing the precautionary principle, an ongoing CBD mandate.

Re ¶ 15: Fair and equitable sharing of benefits – *equality* – is of major importance to us. For decades CFSC has worked toward the full implementation of the *UN Declaration on the Rights of Indigenous Peoples* in Canada and internationally. The *UN Declaration* provides in Article 11:

1. Indigenous peoples have the right to practise and revitalize their cultural traditions and customs. This includes the right to maintain, protect and develop the past, present and future manifestations of their cultures, such as archaeological and historical sites, artefacts, designs, ceremonies, technologies and visual and performing arts and literature.

2. States shall provide redress through effective mechanisms, which may include restitution, developed in conjunction with indigenous peoples, with respect to their cultural, intellectual, religious and spiritual property taken without their free, prior and informed consent or in violation of their laws, traditions and customs.[[7]](#footnote-7)

Applications of SB are clearly already powerful enough to by-pass the free, prior, and informed consent of Indigenous Peoples and to undermine Indigenous Peoples' intellectual property and other inherent rights under international law. ¶ 66 (i) and (k) indicate interest in working to rectifying this existing gap. We strongly urge the CBD to take this issue of biopiracy and cost and benefit sharing forward by seeking input from Indigenous Peoples.

As was noted in the online discussion, CFSC is concerned that a profit-driven approach to SB may facilitate inequitable exploitation of land now used by the poorest, including farmers. The profit-motive would tend to put valuable assets related to SB under the control of a few wealthy stakeholders; this would undermine fair and equitable sharing.

Re ¶s 35-38: The work cited above in the 2nd and 3rd paragraphs of this section, if applied with some rigor, might well enhance the assessment of benefits and risks, which in the AHTEG report are simply dealt with by listing them.

Re ¶ 52: We question whether “the principles and methodologies of risk assessment, as well as risk management measures, established for LMOs can serve as a basis for addressing potential adverse effects associated with organisms developed through synthetic biology.” We do not believe this is an accurate reflection of the level of risk many members of the AHTEG noted that applications of SB, such as gene drives, already represent. The December 2015, International Summit on Human Gene-Editing has further demonstrated that synthetic biology is a powerful and unprecedented technology creating novel ethical challenges which require anticipatory and on-going governance.

Re ¶ 55 (a) We agree that “...the impacts of SB would benefit from a focus on the potential impact of organisms that are being developed for intentional introduction into the environment and which are capable of replicating or reproducing.” However, we would think it prudent to also consider those planned for release that are deemed not capable of replicating or reproducing as they may still have ecosystem impacts and to consider the less likely (but perhaps more devastating) unintended release of those SB organisms planned for contained use.

Re IX (Outlook And Possible Elements Of A Way Forward):

1. The anticipatory approaches cited above would lend strong support to (a) as stated.

(b) A proactive, anticipatory approach as noted above would regularly review SB developments and would lead to action earlier than the proposed criterion of

 “if voluntary codes or current regulatory procedures appear insufficient.”

(c) We agree and endorse the following statement (with the addition of “and all

 persons in the region” after “ecological systems”):

“Therefore, the use of synthetic biology must be based on a precautionary approach…Furthermore, an environmental and commercial release of organisms resulting from synthetic biology must not be performed until procedures and regulatory processes or international regulatory frameworks are in place to ensure the protection of ecological systems”

(f) An online platform may be a good way to distribute information to those with

 sufficient SB experience. However, we believe such a platform would not be the

optimal way to build capacity and trust.

(g) We recommend developing a supplemental framework for guiding the safe and

 robust development of synthetic biology, a framework that would incorporate

 anticipatory governance and a focus on sustainability principles and methods.[[8]](#footnote-8)

5. Further considerations — Several issues not specifically addressed in the report are

 worthy of further consideration:

1. *Assessing SB and loss of biodiversity* — Since SB may make a positive or a negative contribution, directly or indirectly, to the radical loss of biodiversity the earth is now experiencing, it would be wise for the CBD to keep under active and ongoing consideration the relationships between the development of SB and measures of biodiversity (genes, species, ecosystems) and its loss. This would be an essential element in a proactive approach to the assessment of SB.

 (b) *Risks of SB yet unidentified* — The powerful technology of SB will present

 unrecognized issues and threats. Some of these will be direct effects and others

indirect. Some means of systematic scanning for unrecognized issues and the arts would seem appropriate, as suggested in the approach “real-time technology assessment.”[[9]](#footnote-9)

 (c) *Denigrating attitudes toward life* — Some have recognized that synthetic biology could demean our valuing of life, with dreadful consequences. Schwagerl[[10]](#footnote-10) wrote

 The greater danger [than escape of SB organisms from laboratory containment] is that scientists change fundamental attitudes to life for the worse: an industrial biology that…treats living creatures as mere “technology platforms”…The eugenic crimes of the twentieth century are a strong warning of just how wrong developments can go.

In Pope Francis’s 2015 *Encyclical*[[11]](#footnote-11) he says:

This sister (Mother Earth) now cries out to us because of the harm we have inflicted on her by our irresponsible use and abuse of the goods with which God has endowed her. We have come to see ourselves as her lords

and masters, entitled to plunder her at will.

This is not someone else’s problem. If SB is to fulfill its positive potential, those who influence its course should be attentive to the potential for unintended demeaning of life. We would request inclusion of this point in the listed risks.

 (d) *Engagement of the public* — In the long run, the benefits and risks of synthetic biology will be best weighed by the public and its democratically-elected

 representatives. Sarewitz[[12]](#footnote-12) notes, “Risk is more a political and cultural

 phenomenon than it is a technical one…Values, governance regimes and

 research agendas can co-evolve in response to such knowledge [a well-

 informed public].” Just as the CBD has recognized the importance of giving

 voice to Indigenous Peoples and those affected by SB, so we might

 consider how to reach out to the general public about SB on an ongoing

 basis.

6. Recommendations —

1. Some means be found to engage Indigenous Peoples on SB,
2. CBD explore proactive approaches to governance of SB as described in 4. above and in the references cited on pg 3, including a focus on sustainability,
3. The proactive approach be an implementation of the precautionary principle,
4. Alternative means of financing the development of SB be explored to facilitate fair and equitable sharing of benefits,
5. All SB products, regardless of intended level of containment, be evaluated for their direct and indirect impacts on people and ecosystems,
6. In IX (c), the following be inserted after “ecosystems”: “and all persons in the region”,
7. In IX (f), in addition to an online platform to distribute information about SB, other methods be explored to build capacity and trust,
8. In IX (g), supplementary strategies using anticipatory governance be employed for guiding the safe, sustainable and robust development of SB,
9. Re “Further considerations (a),” the CBD develop a specific strategy for tracking the impact of SB on biodiversity (genes, species, and ecosystems),
10. Re “Further considerations (b),” the CBD use an approach like real-time technology assessment[[13]](#footnote-13),
11. Re “Further considerations (c),” the CBD consult bodies such as the International Genetically Engineered Machines competition, which have experience introducing people to SB, to address issues concerning the disrespect of living beings,
12. Re “Further considerations (d),” the CBD explore ways that the public has been consulted and involved in the development of SB, including the specific examples cited in ref 11.
13. The CBD add “Shift in fundamental attitudes about living beings, with negative impacts on biodiversity” to the list of Potential Adverse Effects.

1. Craig Holdrege. 2014. When Engineers Take Hold of Life: Synthetic Biology. *Nature Institute.* Available at: <http://www.natureinstitute.org/pub/ic/ic32/synbio.pdf> [↑](#footnote-ref-1)
2. Arnim Wiek, David Guston, Emma Frow & Jane Calvert. 2012. Sustainability and anticipatory governance in synthetic biology. *International Journal of Social Ecology and Sustainable Development 3(2): 25-38. doi: 10.4018/jsesd.2012040103* [↑](#footnote-ref-2)
3. David H. Guston & Daniel Sarewitz. 2002. Real-time technology assessment. *Technology in Society* 24: 93-109. Available at: <http://archive.cspo.org/documents/realtimeTA.pdf> [↑](#footnote-ref-3)
4. Joy Y. Zhang, Claire Marris & Nikolas Rose. 2011. BIOS Working Paper No. 4: The Transnational Governance of Synthetic Biology: Scientific uncertainty, cross-borderness and the 'art' of governance. <http://www.kcl.ac.uk/sspp/departments/sshm/people/academic/marris/TransnationalGovernanceSynBio2011.pdf>  [↑](#footnote-ref-4)
5. Andy Stirling. 2010. Keep it complex. *Nature* 468: 1029-1031. Available at: <http://www.researchgate.net/profile/Andy_Stirling/publication/49703137_Keep_it_complex/links/0a85e53106cefb82e6000000.pdf> [↑](#footnote-ref-5)
6. See A Wiek et al, *op cit* [↑](#footnote-ref-6)
7. United Nations Declaration on the Rights of Indigenous Peoples. March, 2008. *United Nations.* Accessed at: http://www.un.org/esa/socdev/unpfii/documents/DRIPS\_en.pdf [↑](#footnote-ref-7)
8. See A Wiek, *op cit.* [↑](#footnote-ref-8)
9. See DH Guston and D Sarawitz, *op cit* [↑](#footnote-ref-9)
10. C Schwågerl: *The Anthropocene* Synergetic Press 2014 p 132 [↑](#footnote-ref-10)
11. #  *Laudato si* (Praise be to you-On Care For Our Common Home); Encyclical, Pope Francis, May 24, 2015

 [↑](#footnote-ref-11)
12. D Sarewitz: Science can’t solve it. *Nature* 25 June 2015 *522*: 413 [↑](#footnote-ref-12)
13. See DH Guston and D Sarewitz, *op cit* [↑](#footnote-ref-13)