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OCTOBER 2022

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Survive and Thrive

Why BC needs a CO_2 removal strategy now

Climate change is a threat to all life on Earth and greenhouse gas (GHG) emissions are the culprit. While governments have taken steps to mitigate the damage by cutting carbon emissions — and to adapt to unavoidable climate conditions — it will take further effort to head off the danger.

To give ourselves a chance at avoiding the worst effects, we need solutions to counteract current excess emissions and to compensate for future emissions. These solutions can be found in negative emission technologies (NETs), and there is no pathway that will get us to where we need to be without them.

But to have enough NETs soon enough, British Columbia needs a strategy. There's no other path, and no other time to create a strategy but the present, if BC wants to not only survive climate change, but even thrive despite its challenges.

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Negative emissions is the removal of GHGs from our atmosphere to address climate change. Carbon dioxide (CO_2) is the usual target (i.e., carbon dioxide removal) and it may be removed directly from the atmosphere or indirectly via the oceans. Where negative emissions are the goal, negative emissions technologies (NETs) are the means. There are various NET methods but what they all have in common is that they take carbon from the atmosphere and lock it away in long-term storage within vegetation, soils, rocks, geological reservoirs and more. Examples of NETs include:

- machines that remove CO_2 from the air and send it to storage;
- land management that increases the storage of carbon in plants and soils; and
- changing of ocean chemistry to indirectly draw down CO_2 from the air.

To be a true NET there must be an additional and net-negative GHG outcome from a project-level lifecycle perspective. This is essential because different configurations of seemingly similar project and technology elements can result in different outcomes.

We know what general options are available for NETs but an organized sector does not exist yet. Nevertheless, NET proponents, including developers, financiers and marketers, are emerging based on demand from the few organizations pursuing voluntary GHG removal goals, and based on speculation about what policy may arise.

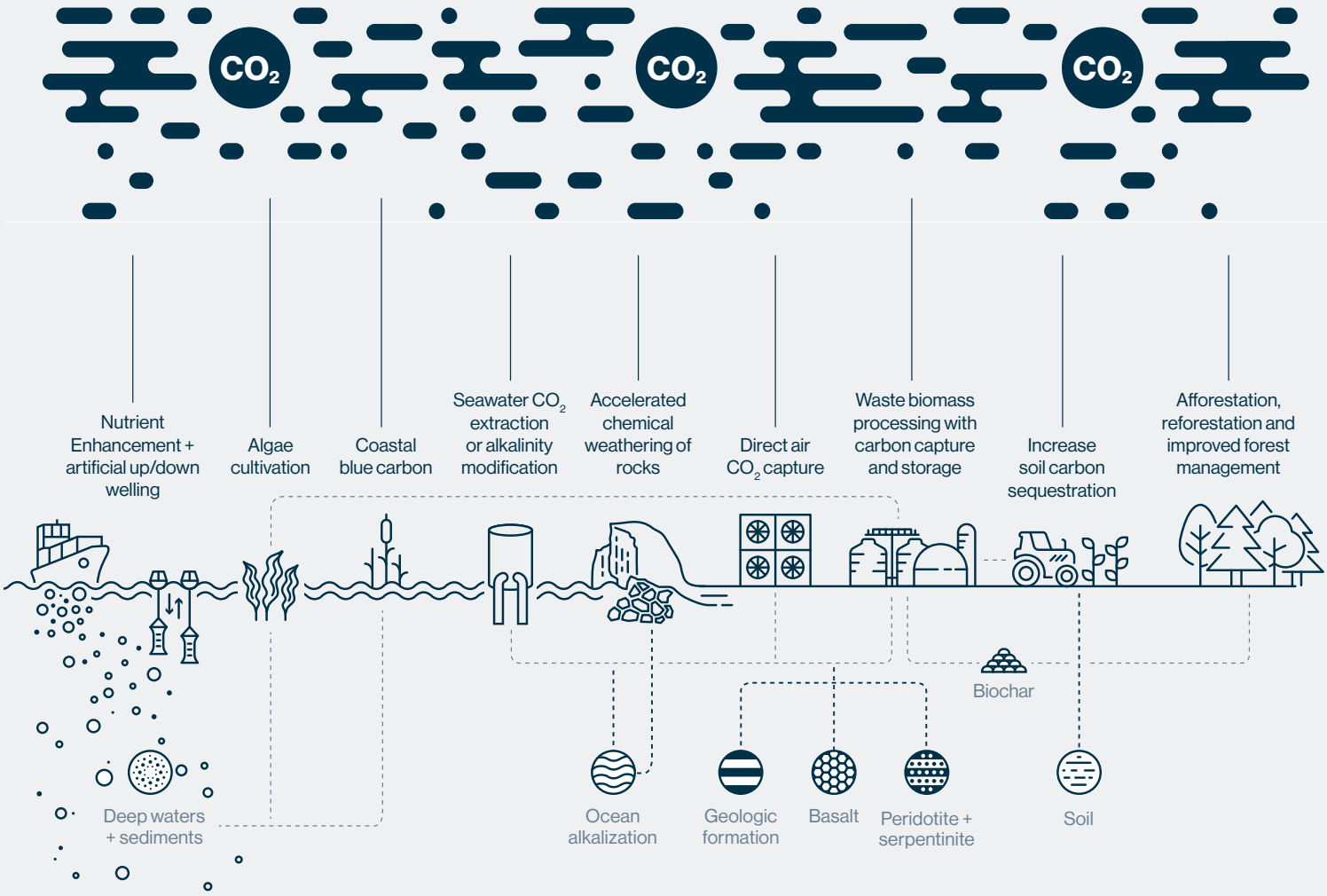


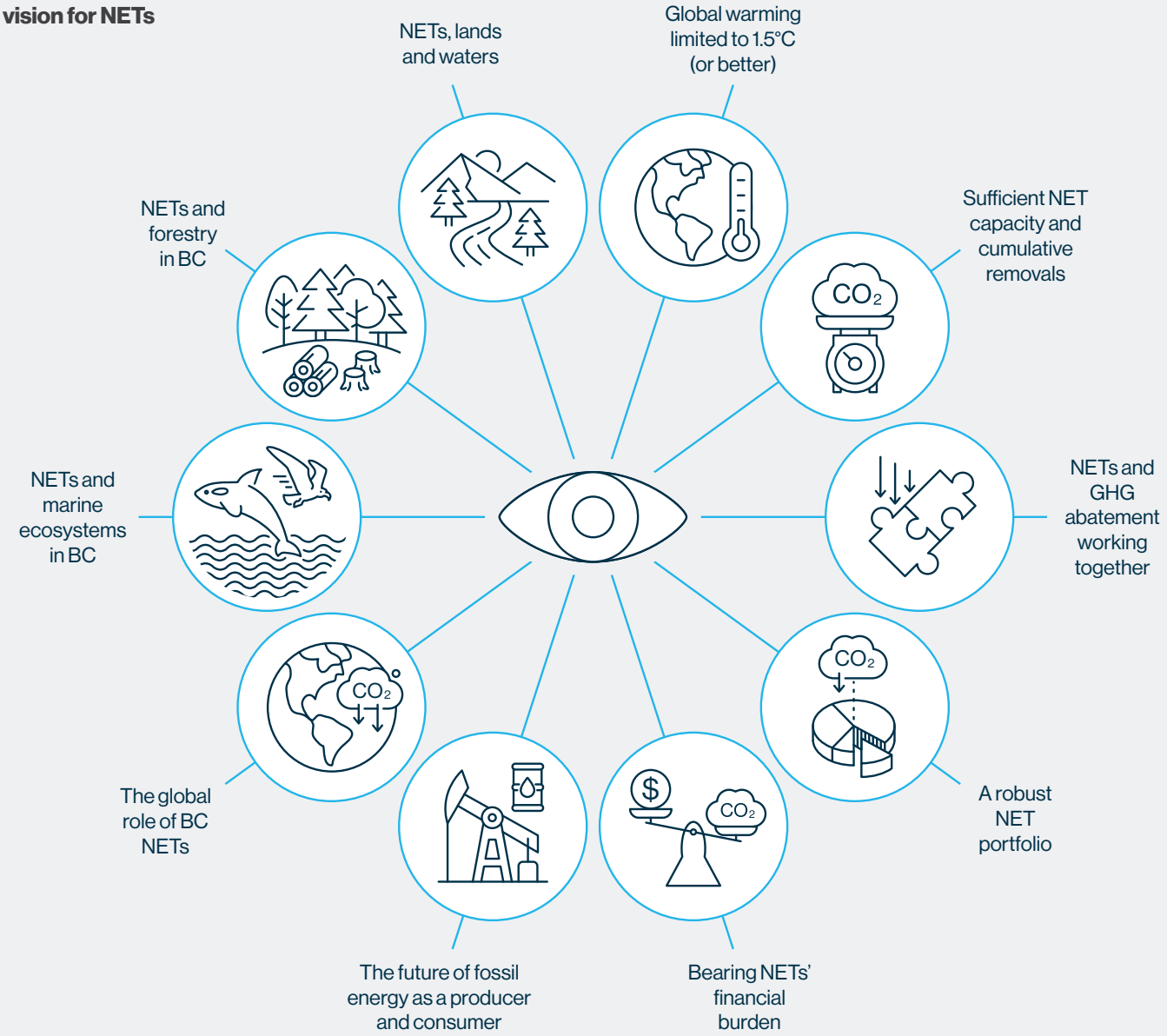
Illustration adapted from *CDR Primer*[1]

[1] Wilcox, J., Kolosz, B., Freeman, J. Eds. *CDR Primer.* (CDR Primer, 2021). https://cdrprimer.org

We need a CO_2 removal strategy to guide this sector, how we approach innovation and build capacity across a variety of NET solutions. *Survive and Thrive* makes the argument why and articulates what it can mean to be strategic. Key elements, among others, include:

- **Adopting a co-production process that brings together policymakers, industry and more to build the sector.** The absence of an established sector and the complexity of NET further supports a proactive role for policymakers. A strategy should seek to combine the agility and ingenuity of the private sector with the long-term risk capacity of the public sector.
- **Growing the NET sector as an integrated whole, which means supporting a portfolio of solutions and the people behind them.** Near-term, the goal is to bring an effective NET sector into existence; long-term, it means ensuring the sector is sustainable.
- **Ensuring a strategy is adaptive so that it can work with uncertainty, risk and opportunity.** There must be a commitment to building both NET capacity and institutional knowledge. Enabling finance for first-of-a-kind, pilot and larger-scale initiatives can create positive learning-by-doing feedbacks — but only if our culture and processes are set up to accommodate it.

A vision for NETs



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> *We need to strategize more effectively and to set richer objectives than mere quantities of negative emissions.*

If we are to stabilize climate change, significant scales of NETs together with drastic reductions in positive emissions are required. BC shares in this global responsibility but also has the potential to make an outsized contribution and generate economic benefit.

Within this opaque and unregulated space, there may be doubt in the credibility of net permanent removals, the scalability of solutions and whether the jurisdiction-wide portfolio is sustainable in the long term. The effect is that no one is at the helm directing us towards sufficient quantities of NETs, with the right qualities, for the right reasons.

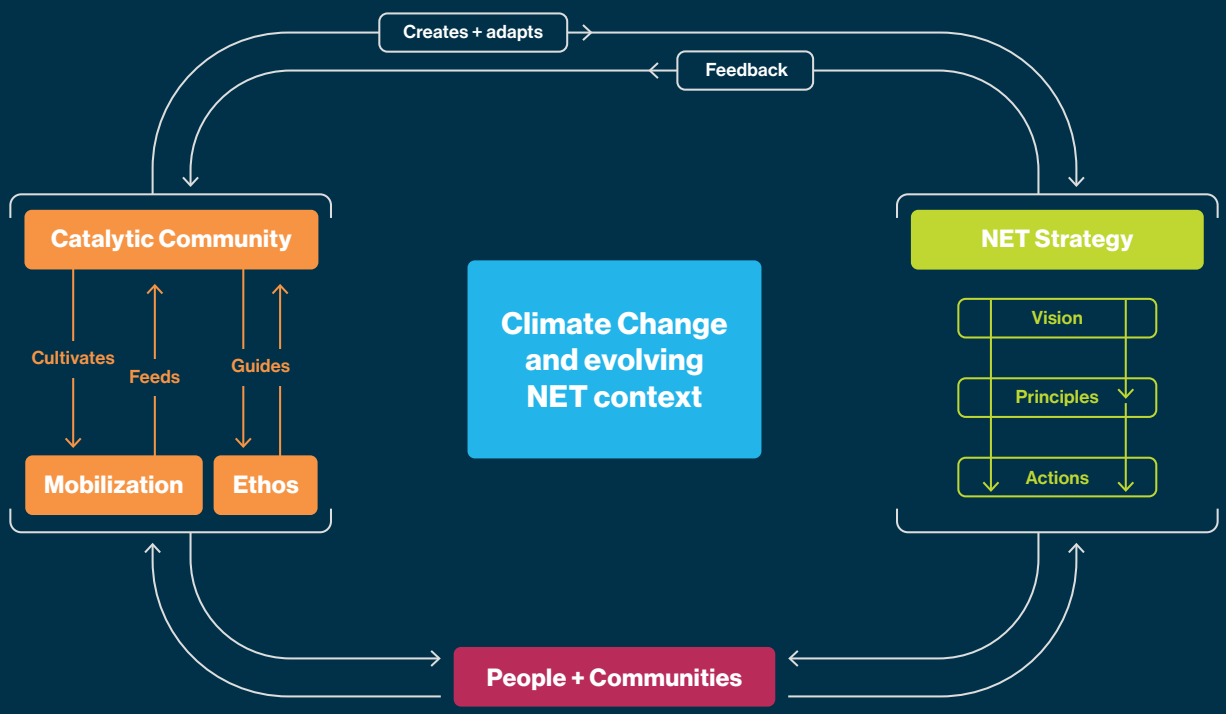
We also know that within BC and Canada, we have consistently failed to achieve GHG emissions reduction targets. Further, we tend to do poorly in translating innovation investments into productivity. A likely continuation of this pattern would see us eventually being inspired to make NETs a priority, making a naïve application of our standard strategic practices and reacting with surprise at our subsequent failure.

Added complexity arises from NET development being interconnected with the resources and infrastructure required by the rest of a net-zero transformation, and from unchecked NET development risking prolonged net-zero incompatible practices. Meanwhile, simplifying matters is certainty in the longterm domestic need and, likely, export opportunity. We need to strategize more effectively and to set richer objectives than mere quantities of negative emissions.

Survive and Thrive serves as a primer in what we propose as the next step in developing a provincial NET strategy: convening leaders within policymaking, industry and more who would be charged with developing a first iteration of a NETs vision and principles. This "catalytic community" is retained through developing roadmaps specific to each NET subclass and synthesis to identify priority actions for the sector.

We expect a collaborative effort demanding broad participation from across the province, including the public, and the Pacific Institute for Climate Solutions is here to help facilitate it.

An approach for NET innovation



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Principle for NETs

Principles guide the development of policy actions working towards a vision. They provide the essential compass for navigating decision-making in an environment of uncertainty and of divergent priorities and values. BC could benefit from such guidance, but it needs to first articulate its principles for NETs. Synthesizing the ideas in this document, we suggest that a minimum set of principles should respond to:

The strict GHG requirements of climate goals **Building NET sector capacity** **The challenges of NETs governance**

Key takeaways

What are NETs, and why they are important?

- NETs are an essential component of meeting climate targets — reduced emissions aren't enough on their own.
- NETs are the only option to reverse GHG emissions.
- Diligence is required to ensure something is really a NET as deployed.
- BC needs a strategy for developing the NET sector.

The need, the opportunity and consequences

- A commitment to net-zero GHG emissions is also a commitment to NETs.
- NETs do not absolve us from pursuing drastic emissions reductions.
- When it comes to NETs, policymakers hold a key role towards an effective strategy.
- NETs can be motivated by responsibility and/or economic opportunity – and either way, we need capacity.
- We need to translate long-term confidence into near-term action.

Challenges and early warnings

- NETs are likely to be just as or more disruptive as other elements of a net-zero transition.
- NETs' character, timing and project-level circumstances have technical and governance implications.
- Current motives behind NETs might not be aligned with a sustainable future.
- A better, more coordinated research, development, demonstration and deployment (RDD&D) approach is recommended.

Building NET capacity

- Do not just build NETs, build the system – environment, relationships, processes, etc. – to build NETs.
- NETs are not displacing incumbents, yet established interests stand to win and lose. Those with foresight are seeking to shape NET solutions and policy to their advantage.
- Public-industry co-production might create better institutional capacity for NETs. Breaking down jurisdictional and disciplinary silos can help NETs benefit from existing expertise.
- Building the NET ecosystem means supporting the technologies and the actors pursuing them. Envisioning the future can inform proactive measures spanning early stages through large-scale deployment.
- NETs require deeper understanding of progress and potential. This may be achieved with technology-centric roadmaps reflecting technical, economic, supply chain, regulatory and further dimensions.
- Rethinking risk, opportunity and responsibility might reframe NETs as a climate change hedge, and not just a sectoral mitigation tool. The corollary is how risk and incentives may be redistributed to grow participation.
- NETs require working with uncertainty but urgency demands we avoid analysis paralysis. This might be overcome by placing value on learning and investing in learning.