PROJECT NAME: Opportunities for Circularity in the North American Electronics Sector. Phase 1.

1. **Project duration: from date to date** (24 months)

2. **Budget (C$)** – $750,000 Canadian dollars (including administrative and operational costs)

3. **Short statement of the issue(s) under this topic, need/gap identified; the project objective(s) and activities to address the issue; and expected outcomes and benefits/beneficiaries (max. 200 words):**

   Electronics have become the world's fastest-growing waste stream, amounting to an estimated 57.4 million tons in 2021.[1] This "waste" stream contains discarded products and raw materials valued at nearly $60 billion globally. McKinsey has signaled that the electronics sector (especially electronic equipment, semiconductors, computers and electronics, and mobile/communications equipment) is likely to see rising demand and larger shifts in production facilities and supply chains driven by regionalization.[2] Increasing circularity for the electronics sector in North America requires better product design, longer use through repair, refurbishment and remanufacturing efforts, and better collection and recycling at end-of-life. Preliminary research on increasing value retention processes in Canada show significant potential for this sector to deliver both socio-economic and environmental benefits (details in ECCC's VRP report).[3] In the United States, multiple lines of federal efforts to enhance electronics circularity also support environmental, economic competitiveness and national security objectives. While in Mexico, circularity research has highlighted the potential of repair practices, as well as the barriers and opportunities in business models and good circular economy practices for the country.[4]

   The electronics sector is being proposed as the focus of this first CEC initiative on Circular Economy because of the high interest from North American consumers.[5,6] In addition, it lends itself well to advance the North American conversation on circularity and raise awareness of circularity and its socio-economic and environmental benefits in this diverse and decentralized region.

[1] Platform for Accelerating the Circular Economy (PACE) Action Agenda for Electronics. 2021.
[2] Doheny, Gomez et al. To regionalize or not? Optimizing North American Supply Chains. McKinsey & Company. 2022.
[3] Socio-economic and environmental study of the Canadian remanufacturing sector and other value-retention processes in the context of a circular economy / prepared for Environment and Climate Change Canada by Oakdene Hollins and Dillon. 2021.
[4] La extensión de tiempo de vida útil en teléfonos celulares en el marco de la economía circular y el cumplimiento de la Contribución Nacionalmente Determinada (CND)/ prepared by the Instituto Nacional de Ecología y Cambio Climático (INECC). 2021.
[5] Côté & Denoncourt. Working Towards Repairable Appliances and Electronics in Canada. Diagnosis, issues and solutions. Équiterre. 2022.

This initiative aims: 1) to study the potential of circularity in the electronics sector in North America, focusing on opportunities related to design, innovation, sustainable production, efficient use of resources, reuse, repair, refurbishment, and remanufacturing, while highlighting "bright spots," case studies, and lessons learned for the economies of Canada, Mexico, and the United States; and 2) to identify opportunities for regional cooperation in the electronics sector and develop practical tools that support the industry, governments and society to advance circularity in each country as well as in the regional supply chain of the sector.

The Design Team suggests that CEC work on Circular Economy should follow a long-term vision, with the initial efforts focused on the electronics sector and delivered in two phases. The first phase (described in this document) will include two components:

1. The development of a research study that will offer relevant context and considerations for the advancement of circularity in the electronics sector of each country, to raise awareness of the concepts and potential benefits of circularity among decision makers across the public and private sectors.
2. Circularity opportunity pathways will outline potential options/opportunities for cooperation in North America toward enhancing the upstream circularity of the electronics sector across the region (through approaches such as design, innovation, reuse, repair, refurbishment, and remanufacturing).

The results of this first phase will provide key input for the conceptualization of a potential follow-up project on Circular Economy, a Phase II of CEC work to be developed with additional resources after the conclusion of Phase I.

[6] Shorthouse. Circular North America: Accelerating the Transition to a Thriving and Resilient Low-carbon Economy /prepared for Environment and Climate Change Canada and the United Nations Environment Programme by The Delphi Group. 2021.

4. **Select the strategic pillar(s) from the 2021–2025 Strategic Plan that the project addresses:**

- ☐ Clean Air, Land and Water
- ☐ Preventing and Reducing Pollution in the Marine Environment
- ☒ Circular Economy and Sustainable Materials Management
- ☐ Shared Ecosystems and Species
- ☒ Resilient Economies and Communities
- ☐ Effective Enforcement of Environmental Laws

5. **Describe how the project uses strategic, cross-cutting approaches in its implementation: Innovative and Effective Solutions and/or Diverse and Inclusive Stakeholder Engagement and Public Participation (including gender and diversity effects and opportunities, and youth) (max. 100 words).**

In collaboration with the Platform to Accelerate Circular Economy (PACE) this initiative aims to use an iterative approach, including stakeholder engagement, co-creation, and co-design throughout the process. To understand the potential of circularity and identify concrete avenues of action to foster circularity at a national and regional scale, this initiative will focus on upstream solutions which are necessary to scale up circularity efforts. Moreover, to increase understanding and raise awareness of circularity in North America, efforts will be made to identify how to raise the collective level of ambition for the countries and region for both public and private sectors.

6. **Explain how the project can achieve more impact through trinational cooperation (max. 100 words):**

This initial work aims to understand the domestic context and potential of each country, with respect to circularity in the electronics sector, as well as to identify key options that will advance circularity at a regional scale. The initiative is a first step in a move towards larger-scale efforts to advance circularity and achieve more sustainable supply chains across our highly integrated economies.

7. **Describe how the project complements, or avoids duplication with, other national or international work (max. 100 words):**

This initiative will build on existing studies on circularity from the three countries, as well as on PACE's Circular Economy Action Agenda on Electronics (see Section 11, Activity 1). In addition, we will work closely with the technical representatives from the

three Parties to avoid duplications and make sure this work complements with the countries' existing efforts and under development or future policies/national plans to advance circularity. Given that globally, most work on circularity has focused on technical or policy research, this work will follow an approach that is genuinely additional, involving multi-stakeholder perspectives and including a shared learning experience with early adopters or local initiatives. Furthermore, learning from similarities as well as from differences will be a key learning component and focus of the programme that can further enhance impact.

8. **Describe how the project engages traditional ecological knowledge (TEK) experts or Tribal/First Nations/Indigenous communities, if applicable (max. 100 words):**

When possible, the initiative will take into account Traditional Ecological Knowledge (TEK) or Indigenous Knowledge Systems that have the potential to be applied to circular economy and opportunities for sustainable material management in the electronics sector. In addition, Indigenous communities or organizations could participate in the proposed workshop and the final dissemination stage of the initiative's outcomes.

9. **Describe how the project engages new audiences or partners, if applicable (max. 100 words):**

The initiative will engage the Platform to Accelerate Circular Economy (PACE) as a lead partner during Activity 1 as well as guiding the next steps of the initiative. Moreover, the initiative has the potential to bring together stakeholders across North America on circularity and the electronics supply chain, and enhance collaborations amongst industry, academia, government organizations and NGOs.

10. **Identify the designated partner agencies or organizations committed to implementing this project, as well as other organizations that could be involved, or benefit from it, including through outreach efforts, collaborations or partnerships (e.g.: federal agencies; other levels of government; academia; NGOs; the private sector; civil society; and youth):**

Lead agencies or organizations	Country
Environment and Climate Change Canada (ECCC)	Canada
US State Department	United States
US Environmental Protection Agency (EPA)	United States
Secretaría de Medio Ambiente y Recursos Naturales (Semarnat)	Mexico

Instituto Nacional de Ecología y Cambio Climático (INECC)	Mexico
Platform to Accelerate Circular Economy (PACE)	International

Other organizations/individuals (if applicable)	Country
Other organizations engaged in circularity or sustainability efforts in the electronics sector or already cooperating with the parties (leveraging preexisting and expertise from their side)	Canada, Mexico and the United States

11. In the following table, describe: the project objective(s) and the activities and subtasks planned to achieve the objective(s); the corresponding outputs, expected results and how they will be measured (performance measures); baselines (if known), and targets by end of the project; and the timeline and budget.

OBJECTIVE 1	To study the potential of circularity in the electronics sector in North America, focusing on opportunities related to design, innovation, sustainable production, efficient use of resources, reuse, repair, refurbishment, and remanufacturing, while highlighting "bright spots," case studies and lessons learned for Canada, the United States and Mexico's economies.
Activity 1 ***Budget C$600,000***	*Through an iterative research and engagement process, develop national assessments of the potential for circularity in the electronics sector of each country and identify opportunities that could foster circularity in North America.*
Output(s)	A **Research Study** on the potential for circularity in the electronics sector in North America, whose design and direction are informed by a **facilitated collaborative workshop**. The research will focus on "bright spots" based on known barriers, best practices and case studies including examples from both inside and outside North America with relevant lessons for a country or the entire region. **Scenarios** for scaling circularity in one value chain, across industries, and at a community or local level. **Circularity Opportunity Pathways** on how to address the identified collaboration and knowledge gaps, which might include, inter-alia, infrastructure, capacities and mechanisms needed to foster circularity. These pathways aim to present upstream opportunities and policy

	options and implementations for Canada, the United States and Mexico's economy, while offering an outline of opportunities/options that could foster circularity with a life cycle perspective of the electronics sector of the region.
Expected results, performance measures	A better understanding of the potential for circularity in the electronics sector at a national and regional level, and the corresponding environmental, economic, and social impacts, resulting from increased circularity in the electronics sector. The identification of potential pathways for circularity which might include actions, infrastructure, incentives, policies, or regulations that can help advance circularity in the electronics sector in the North American region.
Baseline (current status), if known	Some baseline information on circularity and the electronics sector has been gathered in the following reports: • Circular North America: Accelerating the Transition to a Thriving and Resilient Low-carbon Economy (discussion paper and event summary – ECCC and UNEP, May 2021) • Executive summary of the socio-economic and environmental study of the Canadian remanufacturing sector and other value retention processes in the context of circular economy (report prepared for ECCC by Dillon, March 2021) • *La extensión de tiempo de vida útil en teléfonos celulares en el marco de la economía circular y el cumplimiento de la Contribución Nacionalmente Determinada (CND)* (report by INECC, 2021) • *Evaluación del estado actual de la Economía Circular para desarrollar la hoja de ruta para México, Brasil, Uruguay y Chile* (INECC, 2020) • Circular Economy Action Agenda: Electronics (report by PACE in partnership with Accenture, 2021)
Target (by project end)	A research study focused on the potential for circularity in the electronics sector in North America. Circularity Opportunities Pathways with upstream opportunities, policy, and implementation options to address the identified knowledge and collaboration gaps to foster circularity in the

	North American electronics sector.	
Subtask 0	Define a work plan with PACE, the partner organization, to narrow the scope and define next steps for the initiative using an iterative process. This task will involve a series of interviews with selected stakeholders (including the Steering Committee). It will also involve the design and preparation, organization, and facilitation of a small, in-person **design-focused workshop** which will lead to a more detailed plan for the work and provide the foundations for the **Terms of Reference** for the implementation of the initiative.	**When: mid 2024**
Subtask 1.1	Conduct a **broader consultative workshop** with key stakeholders in circularity and the North American electronics sector to identify collaboration and knowledge gaps that need to be tackled to advance circularity in the region.	**When: late 2024–early 2025**
Subtask 1.2	Develop a **fundamental research study** assessing the national and regional potential for circularity, based on known barriers, case studies and best practices on circularity in the electronics sector	**When: early 2025–mid 2025**
Subtask 1.3	Develop a **Circularity Opportunity Pathways document** with upstream opportunities, policy, and implementation options to address the identified gaps to foster circularity in the North American electronics sector.	**When: mid 2025–late 2025**
OBJECTIVE 2	To identify opportunities for regional cooperation in the electronics sector and develop practical tools that support the industry to advance circularity in each country as well as in the regional supply chain of the sector.	
Activity 2 ***Budget C$150,000***	*Prioritize and Develop Options for Regional Cooperation*	
Output(s)	**An iterative process to identify and develop options for regional cooperation**. This process aims to validate the results of the pathways produced in Activity 1 and prioritize avenues for action and regional options/opportunities for cooperation.	

	A draft proposal for Phase II of CEC work on circularity in the North America electronics sector, informed by the results of the first phase of the initiative.	
Expected results, performance measures	Through an iterative process, the CEC and the Steering Committee will revise the proposed pathways and define and implement an action plan for next steps. Outcomes may include: Stakeholders and experts in circularity and the electronics sector from the three countries are aware of the options/opportunities identified in the research study and the circularity opportunity pathways for potential regional collaboration to advance circularity in the electronics sector in North America Concrete avenues of action to advance circularity in the North American electronics sector have been identified. The CEC is informed of future CEC work opportunities that might lead to a follow-up phase of this initiative.	
Baseline (current status), if known	N/A	
Target (by project end)	Conclude a process to identify and develop options for regional cooperation on circularity in the North American electronics sector. Implement one or more of the low-hanging options identified in the Circularity Opportunity Pathways. Identify potential (draft proposal) follow-up CEC work on circularity in the North American electronics sector based on the proposed pathways.	
Subtask 2.1	Review options from the proposed pathways for regional cooperation and define an action plan based on the identified priorities and guidance from the partner organization.	**When: late 2025**

Subtask 2.2	Implement the action plan to tackle specific low-hanging options identified in the proposed pathways as regional priorities. * **This activity is subject to the estimated costs of the identified options/opportunities and the available budget within this initiative.*	**When: early 2026–mid 2026**
Subtask 2.3	Delivery of a proposal for a possible Phase II of CEC work on circular economy for the consideration of the Parties.	**When: mid 2026**

12. Describe post-project expected impacts:

Expected impact (by when: month, year)	SMART performance measure(s)
By late 2026, assessments of the potential for circularity in the North American electronics sector focused on "bright spots" will be developed.	The Parties and involved stakeholders will have better understanding of the potential of circularity at a national and regional level.
By late 2026, decision makers will have circularity opportunity pathways with upstream opportunities, policy, and implementation options to foster circularity in the North American electronics sector.	The Parties and involved stakeholders will have a better understanding of the options, including upstream solutions to scale up circularity efforts in the region.
By late 2026, decision makers will be using the proposed pathways to advance the circular economy in the electronics sector with a life-cycle perspective in the North American region.	The stakeholder group will have an action plan to advance specific upstream solutions to scale up circularity in their countries and the region.