

engineering
change
lab



technological
stewardship

The Engineering Change Lab is ...

Tackling A Deep Root: Engineering's Impact on Society. We've shaped our Social Lab's deep system insights around dangerously limited paradigms into an ambitious but achievable plan to enhance the engineering community's contribution towards the greatest challenges of our time.

Creating a Home for Change. We invite engineers who are curious, and those facing a crisis of meaning, to a space with new networks, permissions and tools that re-orient a privileged profession toward building a transformative community at scale.

Innovating out of a Terminator Future. We challenge technology and engineering orthodoxies that often accelerate and compound new problems. We expand the engineering identity to integrate the values & practices of technological stewardship to design & develop the future required of us.

i'm a
tech
steward

Technological Stewardship is a practice that ensures technology is used to make the world a better place for all.

ECL's mission:

Help the engineering community embrace and practice the identity of “Tech Steward”

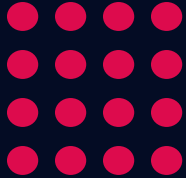
Establish technological stewardship as the new normal in our field.

The Power of Collective Impact

The passion and commitment of

300 from **150**
system leaders organizations

16
core workshops



100
talks &
workshops

10,000+
leaders
engaged



**In 10 years 25% of
engineers in Canada
identify with & practice
technological
stewardship**

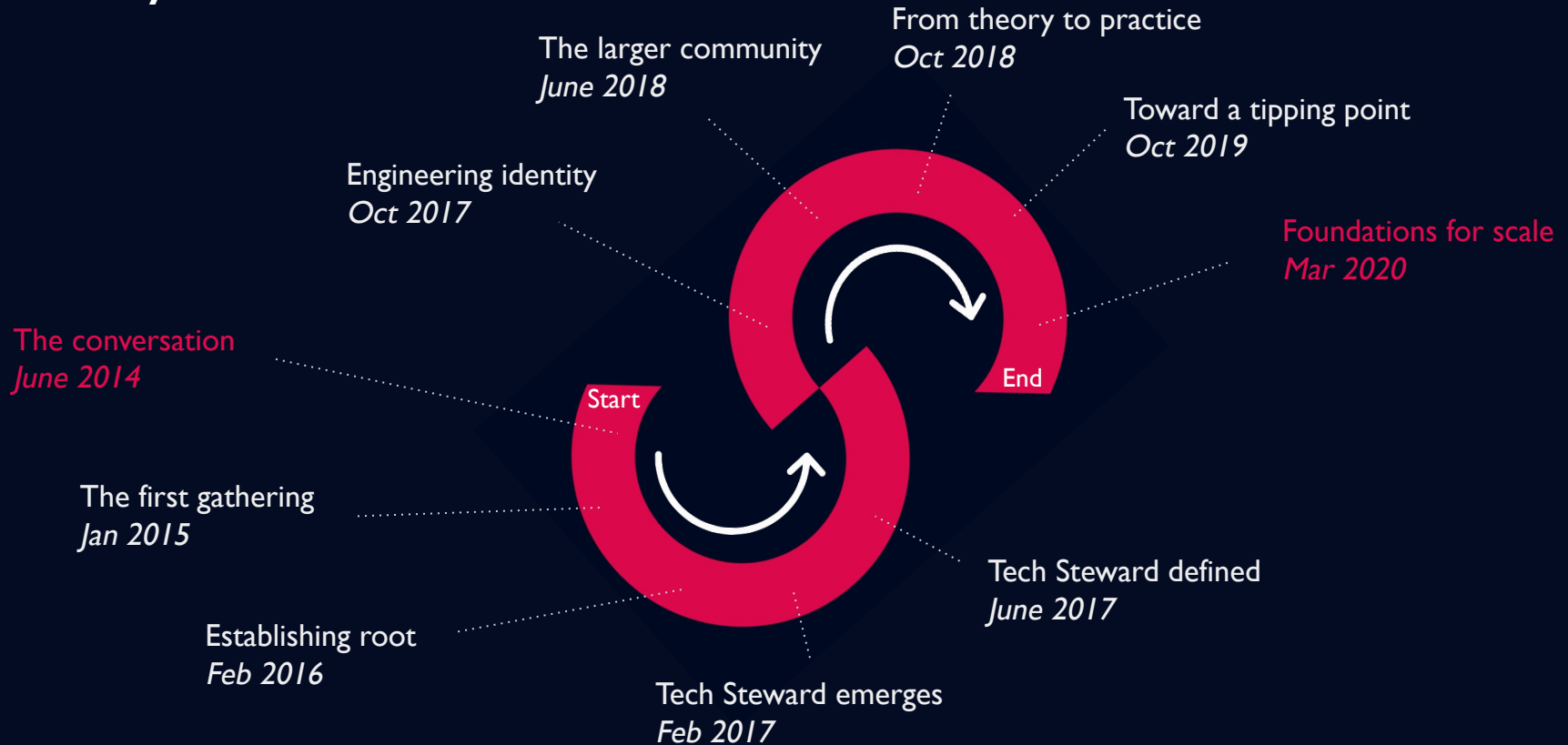
Our Journey

**with the inspiration, participation, and support
of
The McConnell Family Foundation**



Engineering Awakening

The Story of ECL: 2014–2020



“It feels like we’re trying to put together a jigsaw puzzle without the picture on the box.”



Mark Abbott, EWB
June 2014, Exploratory Call

Lesson Learned:

Potential of Professions

It takes significant effort to help a profession understand its full potential, and to manage the inevitable tensions between serving society and its members.

Something’s missing ...

In 2014, leaders from **Engineers Without Borders (EWB)**, **Engineers Canada (EC)**, and **Reos Partners** met to discuss a “Social Lab” focused on the potential of engineering as a force for social good.

- To challenge the technological and engineering orthodoxies that too often accelerate and compound — rather than solve — social problems.
- To create a space to transform and reorient a privileged profession toward solving wicked social problems.

“But are you sure people will show up?”



Adam Kahane, Reos Partners
June 2014, Exploratory Call

Social Innovation Labs are systemic, collaborative and experimental.

They are best used when the problem

- affects many stakeholders & sectors
- can change in unpredictable ways
- has no identified solution

Do other engineers feel this way?

“Social Labs” are a powerful and exciting means of tackling complex societal challenges.

BUT, require strong commitment that typically comes from an obvious burning issue (e.g. civil war, climate change).

Did enough engineering community leaders feel strongly enough about the need for a new approach that they would commit to participating in a Social Lab?

Yes - they did

And over the years we’ve proven that there are many leaders beyond the original group who are eager to engage.

“Wait a minute ...
What is engineering?”



Dean of an engineering school
Jan 2015, Inaugural Workshop
Montreal, QC

Lesson Learned:

Engineering Identity

Too little effort is spent on deeply understanding engineering's role in a rapidly changing world.

What is engineering's higher potential?

We asked a circle of **40 senior leaders from academia, industry, government, professional bodies, and civil society** in a two-day workshop in Montreal.

Midway through the Dean of a major engineering school suddenly exclaimed:

“Wait a minute ... What is engineering?”

It was a “mic-drop” moment. Nobody felt confident in their answer.

In the years since, we keep coming back to this apparently simple root question.

“We have to keep this going — it’s too important for us not to continue!”



Mike Krayacich, Suncor Energy
Feb 2016, Core Workshop #4
Hamilton, ON

Lesson Learned:

Benefits of Running Lean

The Lab’s initially tight budget was a blessing: it created space to fully invest in big-picture sensemaking with less pressure to quickly enact and scale apparently “obvious” solutions.

How do we awaken a new engineering mindset?

The Engineering Change Lab is designed to support four main outcomes:

- insights
- relationships
- ways of working
- initiatives

Original convenors EWB & EC provided resources for the Lab’s first year. EWB hosted the platform.

In Feb 2016, a **Champions Team** — including Suncor Energy, Concordia University, and York University — was established to work on governance and resourcing. Their light-touch governance approach focused on putting the ECL’s mission ahead of organizational interests.

“We must beware of
‘the banality of evil’
and demand more
from engineering!”



Aadita Chaudhury
PhD Candidate, York U
June 2017, Workshop # 8
York, ON

Lesson Learned:

Activism & Stewardship

Activism calls necessary attention to issues and destabilizes power structures. For the average person, however, the challenge is to practically integrate competing perspectives, values and needs.

What is engineering’s role in social change?

As we explored engineering’s connections to social challenges, we learned that many participants felt **conflicted** and **confused** about their engineering identities. They **didn’t see opportunities** to apply their engineering skills to solve social problems.

Inherent in the question was a lively practical debate on emerging creative tensions:

- **Being more explicit about the world we want to see**

And...

- **Imposing values or priorities in unrealistic or undesirable ways**

“I used to think of myself as a former engineer, but the ECL is making me appreciate how much I merge engineering into my social change work..”



Alison Cretney
Energy Futures Lab
Oct 2017, Workshop #9
Calgary, AB

Lesson Learned:

Personal and professional identities are complex and multifaceted.

Critical theories of identity development (like intersectionality) can help make professional identities more robust & useful.

How can we foster a much broader engagement in the engineering process?

We began using the term “**Engineering Community**” to describe anyone who directly contributes to the engineering process — whether or not they are a registered professional engineer.

This terminology shift accelerated our efforts to focus on realizing the true potential of technology to help create a better world.

We also developed tools and sessions to help people explore the rich complexities of their entwined personal and professional identities — further enabling the deep reflection and transformation work necessary to shift larger systems.

“Indigenous Communities have been engineering new technologies in a sustainable manner on these lands since long before settlers arrived — there is much wisdom that can be shared.”



Melanie Goodchild
Turtle Island Institute
June 2018, Workshop #11,
Montreal, QC

Lesson Learned:

Key Adjacent communities

The engineering community needs positive external pressure to support change. Transdisciplinarity is inherent to technological stewardship.

How to build a larger community of influencers?

The engineering community needed better connectivity with “Key Adjacent Communities.” We began establishing relationships with leaders in strategically chosen communities, including:

- the broader “Tech for Good” community
- challenge-focused communities (e.g. Future Cities, UN SDGs)
- social sciences (e.g. philosophy of tech)
- other professions (e.g. architecture)

Importantly, we began working with **Indigenous Elders and leaders** to fundamentally challenge reductionist and extractive assumptions about engineering and technology.

“I agree with the overall argument for Tech Stewardship, but what does it mean practically?”



Meghan Aebig
Urban Systems
Oct 2018, Workshop #12
Vancouver, BC

Lesson Learned:

Scaffolding Down

It's relatively easy to get people excited about the need for Tech Stewardship. It's much more difficult to support individuals in living new paradigms day to day. Here, a principles-based approach is helpful.

How to live the daily practice of a new paradigm?

As Technological Stewardship began to take shape, our focus turned towards questions of **practice**.

The ECL developed a set of eight principles as our hypothesis for the behaviours necessary to ensure technology is benefit all.

We then began experimenting with different ways to leverage these principles, including testing an intervention with cohorts from different organizations, and trialing the “Thoughtful TechnoSapien” podcast to tell the stories of “wayfinders.”

“Every engineer needs to be exposed to this! So how can I bring this back to my team?”



Lynsey Kissane
Ryerson University
Oct 2019, Workshop #15
Toronto, ON

Lesson Learned:

Nested Tipping Points

When you're trying to shift broad paradigms, it helps to break down the bigger shift into smaller, nested tipping points located at different points in the system. Find and connect the innovators and early adopters.

How do we drive to a tipping point?

At all levels, efforts to reform engineering are fragmented and stymied by the influence of dominant paradigms.

The ECL's “**nested tipping points**” strategy is based on research that shows that shifting 25% of people in a system (the innovators and early adopters) creates enough momentum that the rest of the system naturally follows.

To enact our strategy, we broke down the engineering community into sub-communities and levels. We then explored strategies for introducing Technological Stewardship at different entry points in the system.

“We have to meet people where they are.”



Ariel Sim, MaRS
March 2020

Lesson Learned:

Evolution Of Approach

Our approach to systems change began with a heavy focus on sensemaking. We have been shifting our approach towards collective impact ever since. This evolution is both hard and essential.

How to position for scale?

We adopted a ‘Collective Impact’ approach focused on the goal of reaching an overarching tipping point with (25% ~100,00 people) of the entire engineering community in Canada practicing Tech Stewardship by 2030.

Over the remainder of 2020, we began developing the key offerings that will be required.

1. Tech Stewardship Platform (New)
2. Org Consulting Offering (New)
3. Systems Level Initiatives (Evolved)

In order to support the new phase, in late 2020 the ECL transitioned from being based at EWB to MaRS Discovery District which offers the required infrastructure, positioning and purpose alignment.

We've Arrived

Engineers
as
Technological Stewards





Our Framing

The story of engineering is embedded within the larger story of the relationship between technology and society.

Technologies are not merely neutral artifacts. They are value-laden.

We co-evolve with them in complex and powerful ways.



Our Definition

Technological Stewardship is behaviour that ensures that technology is beneficial for all: more equitable, inclusive, just and sustainable.



Our Principles

Seek Purpose: direct technological development to maximize positive outcomes for all

Take Responsibility consider, anticipate and manage the complex impacts of technology across the entire life cycle

Expand Involvement integrate a broad range of non-technical experts & ideas into tech. development

Widen Approaches explore alternative ways to solve problems

Advance Understanding foster dialogue about tech. and technological stewardship

Realize Diversity ensure technological development contributes to creating equity

Deliberate Values consider underlying values and make intentional decisions

Seek Regeneration proceed in a manner that helps enhance the health of the systems with which you engage



Our Commitment

As we build into the next phases, our work is shifting to a **Collective Impact** approach, where outcomes meet our goal of a tipping point of 25% Tech Stewardship practice in Canada by 2030.

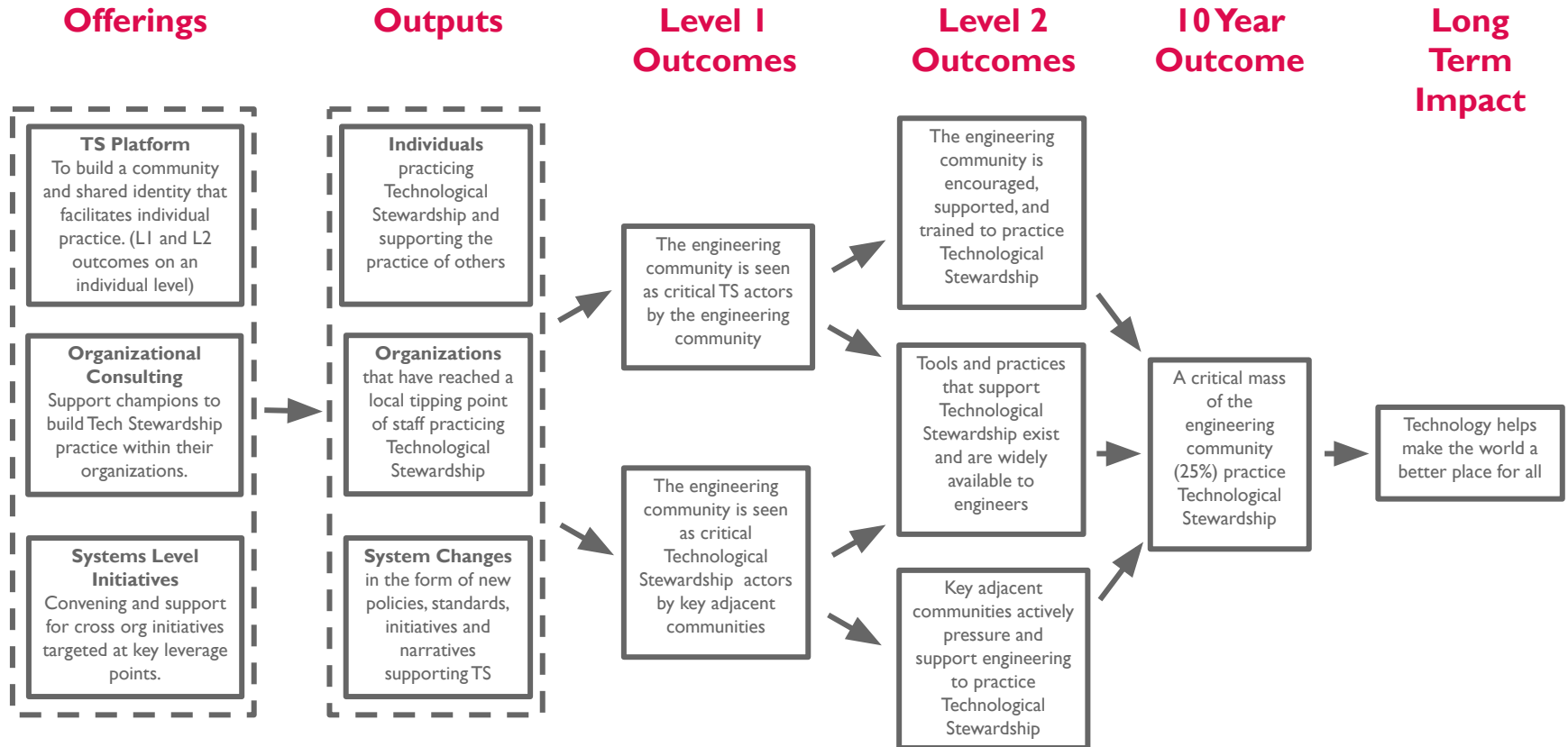
From our new home at **MaRS Discovery District**, we commit to continuously deepening our own practice of **Technological Stewardship** as we continue to act as a catalyst for change.

The Road Ahead

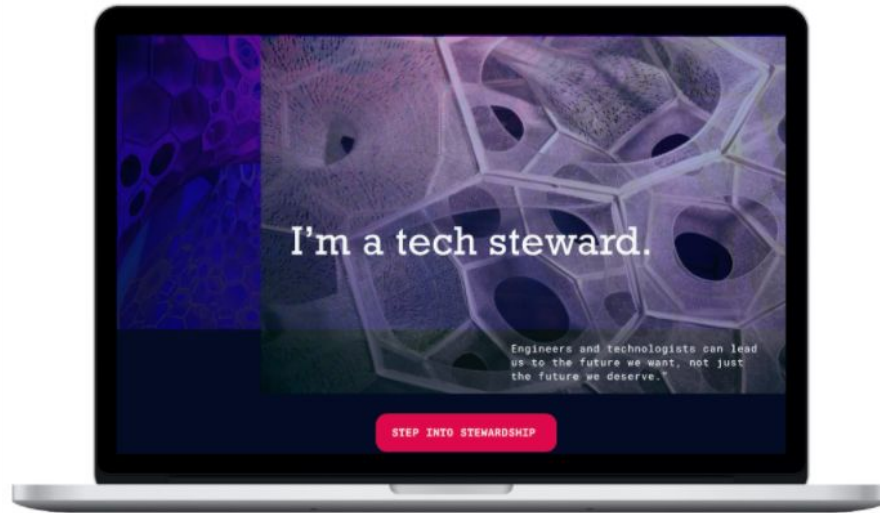
**Achieving a tipping point
within ten years**



Engineering Change Lab's Theory of Change



Tech Steward Platform



SHARE

Our individual stories and weave them into a common narrative

CONNECT

Network connection engine -> 1:1, community building

RESOURCES

Curated and contextualized tools, frameworks, rubrics, etc...

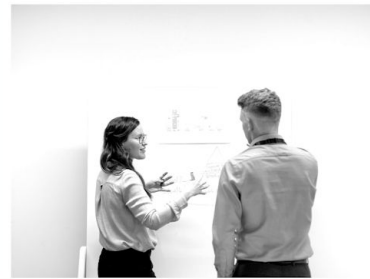
PRACTICE

Encouragement and support of ongoing practice



Organizational Consulting

- Work with consulting firms to develop offerings
- Offerings will support client champions to achieve local 25% tipping points
- Connect with TS Platform and relevant systems level initiatives
- Marketplace on the TS platform

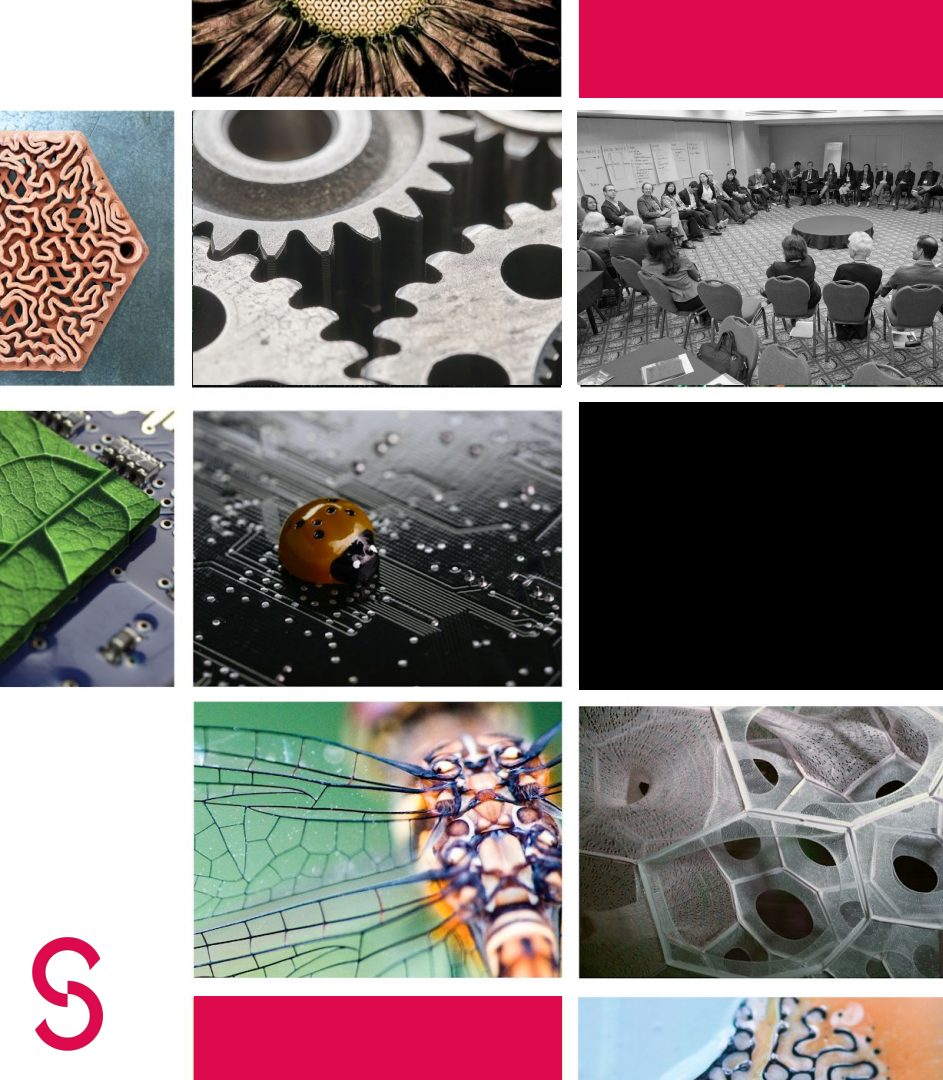


System Level Initiatives

ECL Core Lab
Field building for
collective impact

Indigenous Worldviews
Launch a learning circle

**Engineering
Education Reform**



i'm a
tech
steward

We Invite You

To Join Us in building the Future
the World Requires of Us.