# MEMOIRE

Mémoire sur la Réduction de la Dépendance de la Ville de Montréal vis-à-vis des Énergies Fossiles Action3R.com

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# **1** Introduction

#### **1.1 Growing Pains or Systemic Collateral Damage?**



Society is at a crossroads which would lead it to face rising risks of climate change, loss of bio-diversity, water and energy scarcity, etc. (IPCC 2014) exposed as conflict magnifiers<sup>1</sup>; or finding opportunities in the crisis and the strength of will to make challenging yet inspirational changes for a future worth living in (Robèrt et al. 2002, 213). Documented evidence demonstrates that despite technological advances, society's short-term goal of satisfying its wants and desires is pushing against various kinds of limits: physical / environmental, social, economic (Brundtland 1987; Villeneuve 1990; Rio 1992; Daly 2005; Stern 2006; TEEB 2010).

This growing crisis is driven by major geo-political, socio-economic and ecological trends. While

ardent debates show people's determination to weigh real causesto-impacts, four key trends keep being cited: a growing population applying an inequitable and inefficient allocation resource system, is exhausting supportive yet overwhelmed eco-systems through the wasteful over-consumption of their declining resources (Rees and Wackernagel 1994). These four trends captured are in the characterization of a new geologic time period: the Anthropocene. Scientific studies show human activities are shifting Earth's sub-



systems increasingly outside of their previous half-million years variability range. These trends interact through feedback loops in complex ways, yet these interactions highly depend on *the outcomes* stemming from peoples' values, intents, and actions. And one of the prevalent outcomes–

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<sup>&</sup>lt;sup>1</sup> "While climate change alone does not cause conflict, it may act as an accelerant of instability or conflict, placing a burden to respond on civilian institutions and militaries around the world." (Pentagon 2010, pp. 84-85)

climate change-seems to (directly and indirectly) stem from a specific ethos : "More *is* Better... period."

Yet the era of cheap<sup>2</sup> oil, as the fuel of western society's *atypical growth* in the last centuries, is ending: global Peak Oil<sup>3</sup> was reached in 2011<sup>4</sup> (IEA 2011). Other natural resources are declining as demand swells, fueled both by population growth and higher consumption per capita. Humanity thus faces the shocking prospect of irreversibly altered global living conditions. In view of this biosocial reality check, we arrive at the conclusion that "business-as-usual" policies fostering only incremental improvements, while omitting strategies to attain ambitious common goals, may utterly fail.





There is nothing entirely pre-ordained about the crisis. Deadlock is not an available option, as "business-as-usual" scenarios then ensure moving towards life conditions radically altered that would, with high probability, lead to exceeding various tipping points within the lifetime of our Net Generation children. As Deborah James puts it: "*The future is not a result of choices among alternative paths offered by the present, but a place that is created created first in the mind and will, created next in activity.*"

#### 1.2 Summary of the Global Sustainability Challenge

A durable system means its equilibrium-preserving elements are sustained over time. Scientists have helped frame our global *sustainability challenge*: our society suffers from design flaws<sup>5</sup> generating a systematic erosion of (i) Earth's ecosystems' abilities to continue functioning within the dynamic equilibrium zone we evolved in; (ii) society's ability to globally fulfill fundamental human *needs*<sup>6</sup>.

<sup>&</sup>lt;sup>2</sup> Especially as social and/or environmental costs of fossil fuels are disregarded by classical economists, and more largely, are offset by <u>heavy subsidies</u> pushed through by heavy-handed lobbying, even using <u>revolving doors to shape policy</u>

<sup>&</sup>lt;sup>3</sup> Point of maximum oil production, after which market economics predicts constantly rising costs.

<sup>&</sup>lt;sup>4</sup> Technology may change that date by a decade or so, but the trend still remains: fossil fuel thus is a "<u>sunset industry</u>".

<sup>&</sup>lt;sup>5</sup> stemming from historical roots, simple mechanistic models and various forms of reductionism (see Davis & al. 2013)

<sup>&</sup>lt;sup>6</sup> since resources are not equitably allocated to that end and are instead used to create, and then meet, the market-fueled *desires* of those who can afford them, under the auspices of a mathematical "ideal market" theory

The proverb "The road to hell is paved with good intentions" captures that good intentions are not



enough, when delayed systemic feedbacks boundaries act on constrained of Nature. bv laws Agreeing on genuine answers to complex issues requires shared values, if individual actions are to flourish into large-scale cooperation. To persist enjoying looked-for resources while simultaneously lessening damaging impacts to ecosystems they depend on, societies' understanding of their role in the biosphere must shift (Senge 1990). This would fuel innovative ways to cyclically obtain, convert, market,

distribute, use and renew resources, as exemplified by the <u>circular economy</u> concept.

# **1.3 Answering the Sustainability Challenge: the Framework for Strategic Sustainable Development**

The <u>Framework for Strategic Sustainable Development</u> (FSSD) is a robust, systematic, science-based "full sustainability" strategic platform. Its purpose is to help organizations (<u>thousands of them</u> so far, including whole cities and regions) use science-informed principles in a strategic way to steadily and

systematically reduce unsustainable activities in a step-wise manner. It started in Scandinavia through the cooperative work of scientists, doctors and scores of practitioners of various disciplines, , and is widely known under the name "The Natural Step Method". A significant difference the FSSD and between other sustainability methods/tools is that it defines what sustainability is through Sustainability Principles, instead of relying on the ordinarily used but somewhat imprecise 1987 "Brundtland definition" included in "Our Common



<u>Future</u>". As the FSSD founder Dr. Karl-Henrik argued after the pivotal document was issued, either health practitioners considering human lives or "Planet health" practitioners considering issues of sustainability needed, to do a good work, a thorough understanding of what the minimally needed systemic conditions are to satisfy, or not, current and future human needs.

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## 7 FSSD CONCRETE BENEFITS

- Rigorous definition: as society increasingly bears adverse impacts, to continue using an imprecise definition of sustainability becomes confusing. The FSSD extends Brundtland's definition by stating "sustainability system conditions" drawn from natural/social sciences (Benefit 1 "Define the goal-sustainability-to know where we're going, otherwise we'll end up anywhere but")
- Non-prescriptive: constrains outcomes, not pathways. The sustainability system conditions used as design constraints act as least-constraining guidelines to "de-risk" outcomes (Benefit 2 "Once we know where to go-Montreal-we optimize our modes of transportation, our paths, etc.")
- Strategic bolstering: make strategic sustainability trade-offs infused with creativity, cluedup by scientific knowledge and co-qualified through common values and shared purpose (Benefit 3 "Break the gridlocks where one believes the *only* way to choose is between pest and cholera")
- Integrated approach: ability to use with/orchestrate other sustainability tools and methods (Benefit 4 "To act as a Sustainability Operating System through which other tools/methods gain effectiveness")
- **Time independence:** No need to wait for other parties to use the FSSD to start making gains (Benefit 5 "Cohesive with others in purpose-achieving societal sustainability-yet optimizing our own path")
- Partisan independence: Objective framework facilitates usually "value-laden" discussions (Benefit 6 "Our values differ, yet we rationally agree on what sustainability means, to progress concurrently")
- **Evolving: co-developed and co-evolving through various communities of stakeholders** (Benefit 7 "As diverse groups co-evolve our collective understanding, our confidence and trust increase")

As <u>Chad Park</u> (<u>TNS Canada</u>) and <u>Bob Willard</u> (<u>Sustainability Advantage</u>) <u>put it</u>: "The key performance indicators for truly sustainable organizations must be founded on scientifically based principles that provide the boundary conditions within which society and companies can operate indefinitely. Fortunately, scientists and thought leaders have done much of the heavy lifting for us. Natural and social science can tell us the system conditions for sustainability, either thresholds beyond which irreversible ecological damage may occur or minimum levels of well-being below which society faces divisiveness, instability or, worse, breakdown. We can use these principles as the design constraints for a rigorous and clear articulation of a sustainable enterprise. Then we can excite people in different business functions about what's in it for them as the firm pursues its sustainability journey."

The FSSD has been developed to help us address the Sustainability Challenge, so it is no surprise it can be a formidable tool not only in helping us all systematically and practically answer one of its particular components such as climate change effectively (or the primary sources of climate change, i.e. anthropogenic carbon emissions), but also in helping us all understand how this important issue connects with other important sustainability issues. From that common understanding, we stand a good chance of creating a better world for all of us.

# 2 Answering Montreal's Call to Help Reduce the City's Dependency on Fossil Fuels

While sustainability goals answering the Sustainability Challenge are wide-ranging, fossil fuel dependency embodies many of the issues we face as we envision a "successful" future: a sustainable society in a thriving biosphere. Montreal's call to reduce its dependency on fossil fuels is a vitally important first step towards decarbonizing, as called for in the <u>Paris Agreement</u> reached at <u>COP21</u>.

Briefly presented here are several more tools susceptible to help Montreal reduce its dependency on fossil fuels. In Section 3, practical recommendations will be given about their use by the community.

#### 2.1 Education for Sustainable Development (ESD)

ESD, currently under the aegis of UNESCO, is an umbrella name for many forms of education that already exist. ESD "allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future". It emphasizes educational shifts in order to help people tune in the abilities they need to foster a sustainable future (ESD 2010)

#### 2.2 Future-Fit benchmark

The Future-Fit benchmark is part of a practical research for a "Gold Standard" in sustainability benchmarks. Currently, the <u>first benchmark</u> developed by several groups and practitioners including the Future-Fit Foundation, <u>The Natural Step Canada</u>, <u>Bob Willard</u> and more, addresses the business community. This benchmark is remarkable in the sense it is the first that tries to address the big elephant in the room: usually, benchmarks are relative to prior performance, prior time, or other players. But what happens if one's better than last year, best in class, but still falls short of what is needed? The Future-Fit class of benchmarks (for which a "Cities" version will soon start to be developed) strives to address the absolute need for humanity to refrain from crossing irreversible sustainability tipping points.

# **3** Recommendations

3.1 Use ESD "Educational Shifts" 1. internally, and 2. in the City's exercise of its responsibility towards citizens and various stakeholders, to "allow every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future".

From	То	
Passing on knowledge	<ul> <li>Understanding and getting to the root of issues</li> </ul>	
Teaching attitudes and values	Encouraging values clarification	
Seeing people as the problem	Seeing people as facilitators of change	
Sending messages	Dialogue, negotiation and action	
<ul> <li>Behaving as expert - formal &amp; authoritarian</li> </ul>	<ul> <li>Acting as a partner - informal &amp; egalitarian</li> </ul>	
Raising awareness and	<ul> <li>Changing the mental models which influence decisions &amp; actions</li> </ul>	
Changing behaviour	More focus on structural and     institutional change	

- 3.2 Use a principled science-based sustainability framework:
  - 3.2.1 To help co-create an audacious vision for Montreal 2042 (following the example of other cities such as Gatineau)<sup>7</sup>



<sup>&</sup>lt;sup>7</sup> The City of Gatineau, among others in Quebec/Canada, has used the FSSD to revisit its « Schéma d'Aménagement et de Développement » by co-creating a vision for 2051, and using it to follow on the strategic operationalization of this vision.

- 3.2.2 To benefit from a robust and operational definition of sustainability to guide strategic decision-making processes (especially helping in a non-partisan, non-political way) in selecting smart trade-offs for the community
- 3.3 Use the Future-Fit Business benchmark (especially its component on energy and greenhouse gases) to shape a "Gold Standard for Businesses"
- 3.4 Make an integrated strategy using its "Smart Cities" program, the Sustainability Development Goals and the Future-Fit Business benchmark to guide its development towards resilience



3.5 Make Decarbonisation a priority in Montréal's upcoming urban resilience strategy, to be finalized by Montréal's recently nominated Chief Resiliency Officer Louise Bradette"



# 4 Annex I - FSSD Summary

# **5** Annex II – FSSD Tools for My Organization

### **Common Initiative - Starting Questions**

What can we agree on, based on objective knowledge? Where do we want to be, based on our common values? What does it take for us to get there, effectively & efficiently?

### **Sustainability - Starting Questions**

Does our organization [My Organization] use a principled *science-based* **definition of sustainability** to guide strategic decision-making processes?

What is, *with reference to this definition*, **our organizational contribution** to unsustainable and to regenerative practices in current society?

How may My Organization *methodically close the* **sustainability gap** (i.e. steadily cut out systemically risky impacts) while co-creating **shared value** (e.g. by co-innovating regenerative solutions) to help create our common uplifting future?

TOOLS	What Is It?	How Is It Beneficial?
Five-Level Framework for Planning in Complex Systems (5LF)	This generic <b>structuring framework</b> helping the planning process in complex systems reduces complexity arising in multi-stakeholders endeavors by rendering explicit at which level information is exchanged between stakeholders: <b>System – Success – Strategy – Actions – Tools</b>	<ul> <li>Making discussions easier, more focused &amp; more productive by structuring &amp; clarifying information exchange between stakeholders of My Organization</li> </ul>
Framework for Strategic Sustainable Development (FSSD)	The FSSD uses the 5LF to help planning in the complex system "society in the biosphere". Its purpose is to bring clarity, rigor & insight to planning and decision-making towards a sustainable society in the biosphere. Two key elements include: 1. the establishment of basic principles (or 'system conditions') for sustainable society in the biosphere, which provides a principle-level definition of "success" (see Sustainability Principles below), and 2. the development of strategic guidelines (see Backcasting From Principles & Three Prioritization Questions below) to guide efforts towards success by informing the selection of various actions & tools	<ul> <li>Providing a systems-responsive strategic platform to stakeholders of My Organization, helping them to decrease their unsustainable activities systematically &amp; in a step-wise manner while buffering against systemic shocks</li> <li>Providing stakeholders of My Organization an "operating system" for sustainability applications, helping them use various existing tools in an orchestrated, fully strategic way to provide a "full sustainability" robust platform.</li> </ul>
Sustainability Principles (SP)	To complement the 1987 Brundtland definition of sustainability & provide guidance for sustainable development planning, scientists & practitioners have developed starting in Sweden in the early 1990s a principle-based definition of sustainability through scientific consensus, synthetized in the Sustainability Principles (SP). These build on a basic understanding of what makes life possible, how our biosphere functions and how human societies are supported by Earth's	<ul> <li>Providing stakeholders of My Organization the highest degree of flexibility &amp; freedom of action capable of creating plentiful yet indefinitely durable societies (staving off systemic collapses)</li> <li>Acting as overarching criteria to guide actions of My Organization stakeholders towards success, i.e. a prosperous sustainable society within a thriving biosphere</li> <li>Providing clear guidelines to any</li> </ul>

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TOOLS What Is It?		How Is It Beneficial?
	natural systems.	organization, of any size & purpose, on how not to ruin such an outcome
Human-Scale Development (HSD), Fundamental Human Needs (FHN) & Satisfiers	Human-Scale Development : a praxis meant to tackle the question of structural poverty, a central question in tackling global environmental challenges "Such development is focused & based on the satisfaction of fundamental human needs, on the generation of growing levels of self-reliance, and on the construction of organic articulations of people with nature and technology, of global processes with local activity, of the personal with the social, of plan with autonomy, and of civil society with the state". (Max-Neef 1989)         The Fundamental Human Needs (FHN) are independent of wealth, age, gender, cultural beliefs or worldview. They work as a system in which simultaneities, complementarities and trade-offs are continually assessed. First along an axiological axis: Affection, Creation, Identity, Freedom, Leisure, Participation, Protection, Subsistence, Understanding (to which some have since added Transcendence). Second along an existential axis: Being-Doing-Having-Interacting.         "Satisfiers" are the relative means by which a person's or group's FHN may be satisfied.         FUNDAMENTAL HUMAN NEEDS - SATISFIERS MATRIX         Subsistence         Winderstanding         Being Having Doing Interacting         ************************************	<ul> <li>Providing stakeholders of My Organization with a sound theoretical model to enable</li> <li>creating an economy of well-being, respecting the needs equally accounting for well-being: an inability to fulfill any of them causes "well- being impoverishment" or even a pathology</li> <li>addressing fundamental needs for all, instead of addressing all desires for some</li> <li>finding appropriate combinations of satisfiers, rooting out "destroyers", pseudo-satisfiers and inhibiting satisfiers</li> </ul>
Backcasting from Sustainability Principles (BSP)	Since it is understandably difficult to make many people agree on detailed images of a distant future because values may differ, while technical and cultural conditions keep evolving, BSP suggests a way to optimize the value-creation proposition for all stakeholders even for an indefinite horizon.	<ul> <li>Providing stakeholders of My Organization an effective way to         <ul> <li>develop robust strategies (solving more than just today's issues)</li> <li>formulate a shared vision of the imagined future success to effectively &amp; durably engage stakeholders</li> </ul> </li> </ul>
Three Prioritization Questions (TPQ)	<ul> <li>The following three key questions help in prioritizing actions, along with risk considerations (probability, severity, urgency) and other questions dependent on the topic:</li> <li>Does this action move us in the right direction—effectiveness factor?</li> <li>Is it part of a flexible platform—resilience factor?</li> <li>Does it provide a good-enough return on investment in either of these capitals: human, social, environmental, infrastructural, financial—value factor?</li> </ul>	<ul> <li>Providing stakeholders of My Organization with fundamental questions to         <ul> <li>help strategically assess actions</li> <li>help prioritize actions according to three key criteria of effectiveness, resilience and value</li> </ul> </li> </ul>
ABCD Method	The ABCD method is one of the primary tools used by the FSSD. Its whole-systems approach meshes	<ul> <li>Providing stakeholders of My Organization robust means to:</li> </ul>

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TOOLS	What Is It?	How Is It Beneficial?
	the Sustainability Principles (SP), Backcasting from Principles (BSP), Strategic Guidelines (SG) as well as creative, visioning & consensus-building tools in an integrated way. The output of the ABCD method is (primarily) a Sustainable Development Strategic Plan yet its process yields such insights that stakeholders usually report a positive and empowering change of perspective. This method isn't linear but refines its results iteratively in a spiral approach. A new addition to the "ABCD" method is an "E" step, for Evaluation	<ul> <li>align around a common understanding of sustainability and identify a 'whole- systems' context for the program</li> <li>build a common language around sustainability as well as creating a vision of what that program would look like in a sustainable future</li> <li>conduct a sustainability "gap analysis" of the major flows and impacts of the program to see how current activities are augmenting the risks of rising unsustainability. The analysis usually includes an evaluation of products &amp; services, the energy-water nexus, 5- capitals (human, social, environmental, infrastructural and financial) from 'cradle to cradle', informed by SP and FHN, in order to understand how to positively introduce change</li> <li>brainstorm potential solutions to the issues highlighted in the baseline analysis without any constraints</li> <li>prioritizes the measures that move organizations toward sustainability fastest, while optimizing flexibility as well as maximizing social, ecological and economic returns</li> </ul>
Strategic Life-Cycle Management (SLCM)	The SCLM is an advanced life-cycle approach making use of socio-ecological LCA methodologies, guided by Sustainability Principles (SP) as system boundaries	✓ Providing My Organization's stakeholders a process to use LCA methodologies in a strategic manner, focusing on issues guided by their respective vision while having at their disposal a scientifically robust trade-offs analysis tool using Sustainability Principles.
Template for Sustainable Development (TSPD)	The TSPD focuses on product development starting phases (Concepts & Design) to quickly gain an overview of sustainability opportunities & challenges a product-line offers. Key questions form the basis for a creative & informed dialog between a trans- disciplinary team of product developers (usually including management) and a sustainability expert. Answers are put in a standardized format, creating an evolving "template" for this product-line.	<ul> <li>Letting stakeholders of My Organization gain quickly and in a straightforward way an overview of persistent and sizeable sustainability challenges and opportunities for a particular product-service line;</li> <li>Facilitating an informed and creative exchange between My Organization's stakeholders to create "Sustainability- Enriched" programs in all fields.</li> </ul>
Art of Hosting	The <u>Art of Hosting</u> and Convening Meaningful Conversations explores hosting as an individual and collective leadership practice. It is a "deep engagement" set of participatory practices, such as Appreciative Inquiry, Open Space Technology, World Café, the Pro-Action Café, Consensus Decision-Making, etc.	<ul> <li>Providing stakeholders of My Organization         <ul> <li>a way to meaningfully and effectively</li> <li>go from fragmentation to connection</li> <li>ground actions in that which is             meaningful for all stakeholders</li> <li>access and draw wisdom from all                 collective intelligences</li> <li>lead from the "field"</li> <li>shift organizing &amp; interacting patterns</li> </ul> </li> </ul>

Name	Generic Five-Level Framework	Framework for Strategic Sustainable Development	
Level	Generic System	Global society within the biosphere	My Organization in the global society within the biosphere
System	Objective description: system's boundaries & parts, mechanisms & rules, flows & stores, buffers & feedback loops, stakeholders & needs	Global society within the biosphere, along with laws/norms, humanity & <u>Fundamental Human</u> <u>Needs</u>	My Organization provided by its stakeholders, in the global society within the biosphere, along with laws/norms, humanity & <u>Fundamental Human Needs</u>
SUCCESS	Subjective description: goals of the planning endeavor	Society within the Biosphere, satisfying the <u>Sustainability</u> <u>Principles</u>	<ul> <li>i. Goals of My Organization within its stakeholders' vision</li> <li>ii. Whole-systems global sustainability outlook</li> <li>iii. Satisfaction of the <u>Sustainability</u> <u>Principles</u></li> </ul>
STRATEGY	Planning method and selection criteria for actions	<ul> <li><u>Backcasting</u> from above principles</li> <li><u>Three Prioritization</u> <u>Questions</u> (or more)</li> </ul>	<ul> <li>Backcasting from i. using ii. fulfilling iii.</li> <li>Three Prioritization Questions</li> <li>Other prioritization criteria to reach My Organization's goals</li> </ul>
ACTIONS	Needed actions to reach goal	Actions helping to create a durable society free of unsustainable activities	Actions helping to reach My Organization's goals while satisfying <u>Sustainability Principles</u> using a global outlook
Tools	Supporting tools	Tools helping action: ABCD & other tools for management / validation / follow-up	Tools helping to reach My Organization's goals while satisfying <u>Sustainability Principles</u> using a global outlook

#### FIVE-LEVEL FRAMEWORK FOR PLANNING IN COMPLEX SYSTEMS

#### FSSD Resources -

http://www.naturalstep.org/en/fssd-natural-step-reference-list-now-available (http://bit.ly/11Vc2jL)

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