Adopting a **Net Zero** framework does not cancel your design questions; instead, it provides the "how" for your high-level implementation plan. It narrows your architectural choices toward specific, high-efficiency solutions that satisfy both the **Information and Privacy Commissioner of Ontario (IPC)** and environmental mandates.

Here is how the Net Zero requirement refines and reinforces your established factors:

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# 1. Refined: Safety & "Radical Privacy"

The move toward **On-Device Processing** (Edge AI) is no longer just a privacy choice—it is the only Net Zero choice.

- **Cancelled Ambiguity:** You can now rule out high-energy cloud processing. The "Gold Standard" for protecting neurodivergent users is now also the carbon-neutral standard.
- **The Hardware Kill-Switch:** A physical "Sanctuary Switch" that breaks the circuit is more energy-efficient than a software toggle that requires the system to stay in a "standby" listening mode.

# 2. Refined: Kinship & "Anthropomorphic Connection"

The question of "Aesthetic Choice" is solved by the sustainability of the materials.

- **The "Snap-On" Solution:** Instead of multiple robot versions, the **Modular Shell** approach (using bio-composites) allows for "Aesthetic Sovereignty" without doubling the carbon footprint of the hardware.
- **Haptic vs. Light:** Between haptics and light patterns, **Haptics** often require less energy than high-brightness LED arrays, supporting the "Low Power" requirement for **Ubiquitous Presence**.

# 3. Refined: Deployment & "The Resiliency Bypass"

To ensure the robot doesn't create a "Status Scar" by dying during a crisis, the **Low Power Advocacy Mode** becomes a technical necessity.

- **E-Ink is Essential:** The question regarding the "Notice of Protected Status" is effectively answered. An e-ink display is the only way to show a permanent legal notice to officials without draining the battery, ensuring the robot remains a "Permanent Witness" even at 1% power.
- **5G/LTE Node:** While the dedicated node uses power, it is the only way to bypass "Broken Portals" (school Wi-Fi failures) while maintaining a slim, energy-efficient digital profile.

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## Comparison: Standard vs. Net Zero Architecture

| Factor | Standard Social Robot | Net Zero Sovereign Dyad |
|---|---|---|
| **Data Flow** | Cloud-heavy (High carbon) | **On-Device/Edge** (Low carbon) |
| **Advocacy Display** | Bright LCD (High drain) | **E-Ink "Notice"** (Zero drain) |
| **Material Life** | Planned obsolescence | **Modular Bio-Shells** |
| **Power Loss** | Total shutdown | **Low Power Advocacy Mode** |

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## What this changes for your Plan:

The Net Zero lens actually **strengthens** your application for the **Sovereign Dyad Grant**. It transforms the robot from an expensive "educational toy" into a sustainable, long-term piece of **Institutional Infrastructure** for the YRDSB/OCDSB.

**Would you like me to update your "Physical Architecture" list to specify these Net Zero components (E-ink, Edge AI, Bio-Shells) for your final prototype description?**