

CLIMATE AND SUSTAINABILITY BENEFITS

1. Less scrap and rework (material and energy savings)

By making human and robot collaboration safer and more flexible, SR-1 lets factories:

- Keep robots running at optimal speeds instead of over-slowng or over-guarding them.
- Run more stable, repeatable processes with fewer human-caused interruptions or manual workarounds.
- Reduce scrap and rework because the process is more consistent, which cuts raw material waste, energy used to re-run bad parts, and upstream and downstream transport, handling, and packaging.

Every scrapped part carries embedded energy and carbon from the full supply chain. Fewer bad parts mean lower embodied emissions per good part produced.

2. Higher overall equipment effectiveness (OEE) at lower energy per unit

SR-1 improves OEE without adding more hardware by improving availability, performance, and quality:

- **Availability:** Dynamic safe zones reduce unplanned stops and manual lockouts.
- **Performance:** Robots can run closer to their engineered cycle times instead of being permanently slowed for a worst-case human scenario.
- **Quality:** More stable automated processes usually produce tighter tolerances and fewer rejects.

If a line can produce more good parts per kWh, the energy and carbon intensity per unit drops, even if total energy use is similar or slightly higher.

3. Enabling fenceless and flexible cells (longer asset life, less rebuild waste)

Traditional hard-guarded cells:

- Are expensive and material heavy (steel fencing, guarding, platforms).
- Get scrapped or heavily rebuilt when the line changes.
- Lock in a single product or process for years.

With SR-1:

- Cells can be reconfigured with software and sensor repositioning instead of cutting, scrapping, and rebuilding steel.
- The same robot cell can support multiple SKUs or process layouts over its life.

That reduces steel and construction materials for new guarding, disposal or recycling of old guard hardware, and truck rolls and field work associated with large tear-outs and rebuilds.

4. Smaller footprint per unit of output

Because SR-1 allows robots and humans to work closer together safely and cells to be more compact and multi-use, manufacturers can produce more in the same floor space and postpone or avoid building expansions.

This reduces the need for new heated/cooled floor area, which is a major driver of operational energy and carbon for plants.

5. Better use of existing robots vs. buying new equipment

By unlocking higher utilization of installed robots and automation, customers often get capacity from what they already own instead of buying new machines.

That avoids the upstream emissions from manufacturing, shipping, and installing new equipment. SR-1 acts as a capacity unlock layer, not another heavy asset.

6. Data for continuous improvement and ergonomic sustainability

SR-1 sits at the intersection of human presence and movement, robot states, and zone entries and exits over time.

You can log and use that data for process optimization and ergonomic improvements:

- **Process optimization:** Identify frequent micro-stops and inefficient workflows that add energy and time with no output.
- **Ergonomics:** Reduce risky human tasks by shifting them to automation, leading to fewer injuries and lost-time incidents.

Over time this supports leaner, more efficient workflows and safer, more sustainable work.

7. Summary

SR-1 is a climate-positive automation layer. By enabling safe, fenceless human and robot collaboration, SR-1 increases throughput, reduces scrap, and extends the life and flexibility of existing automation. Manufacturers get more good parts per kWh, less material waste, fewer rebuilds of guard hardware, and higher output per square foot of factory space. The result is lower embodied and operational emissions per unit of production, without forcing customers into new heavy-asset capital projects.