HORIZON-CL4-2026-04-HUMAN-01: *Developing and demonstrating core technologies for Virtual Worlds and Web4.0*

1. General context of the topic

This topic supports the development of **next-generation technologies for Virtual Worlds and Web 4.0**, aiming to create immersive, interactive, and human-centric environments that integrate **eXtended Reality (XR)**, **Generative AI**, and **Cloud-to-Edge computing**. The focus is on enhancing user immersion and interactivity, enabling seamless and realistic connections between digital and physical spaces through multi-sensory feedback, real-time responsiveness, and interoperability.

Projects are expected to deliver demonstrators in real-world scenarios that illustrate how Virtual World technologies can provide value in industrial and societal contexts, paving the way for future **Web 4.0 ecosystems**.

2. Potential contributions from CARTIF

CARTIF can contribute specifically in the following area:

XR applications for human-robot interaction (HRI)

- Development of **XR-based applications for human-robot interaction** in **manufacturing and logistics environments**, enabling intuitive, immersive collaboration between humans and robots.
- Use of **VR interfaces** to enhance training, remote supervision, and safety in human-robot collaborative tasks.
- Collaboration with a **VR SME** specialized in different types of **human–VR interactions**, such as the immersive exploration of photovoltaic (PV) fields using autonomous robots.

3. Target industrial sectors

CARTIF's XR and robotics expertise can be effectively applied in:

- **Manufacturing and logistics**, where XR can improve human-robot collaboration, operator training, and process visualization.
- **Renewable energy**, especially for **remote supervision and inspection** of PV installations through immersive VR systems.

4. Potential CARTIF roles

- **Technical partner** developing XR applications for immersive human-robot collaboration.
- **Integrator** of XR solutions in manufacturing and energy use cases, ensuring compatibility with industrial and robotic platforms.

- **Collaborator** with VR SMEs to validate and test XR-based interfaces for autonomous robotic operations.