

# IEEE BENE WORKSHOP

(BENE - BENEFICIAL MATERIALS AND NUTRITIVE ELECTRONICS)

IEEE Sensors Conference, Rotterdam, The Netherlands  
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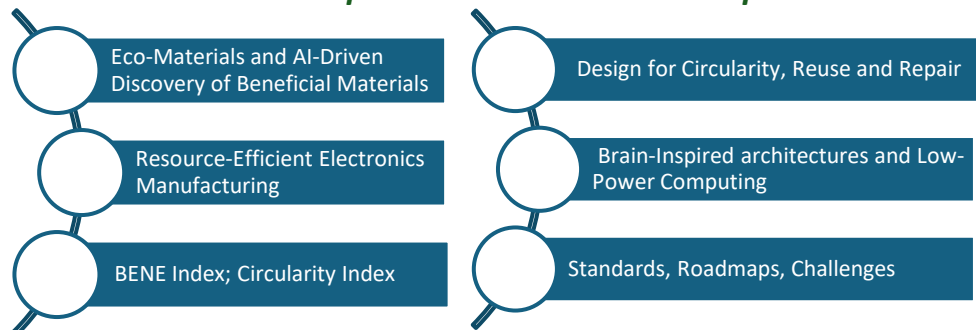
## BACKGROUND

Electronics is simultaneously the world's greatest enabler and one of its most urgent problems. Various sensors, electronic including AI hardware, surgical implants, smart-grid controllers, and agricultural monitors all depend on electronics — yet the same industry generates a record 62 million tonnes (Mt) of e-waste per year, which is expected to rise to 82 Mt by 2030. With only 22.3% of this e-waste formally recycled, USD 91 billion worth of raw material gets wasted annually. Poor e-waste management externalizes an estimated USD 78 billion in health and environmental costs every year. Upstream, semiconductor fabrication consumes about 800 million m<sup>3</sup> of water and emits about 75 Mt CO<sub>2</sub>e annually. The ICT sector alone now accounts for 1.7–4% of global GHG emissions, expected to grow rapidly with AI deployment. Moreover, materials marketed as biodegradable (leading to degradable or transient electronics), may still generate harmful degradation by-products that can be managed, but at a cost that makes it economically unviable to do so. Society needs to *rethink the way we develop and use electronics is critical now. The goal is not fewer electronics — it is better electronics, for people and planet.*

## WHAT IS BENE?

BENE (Beneficial Materials and Electronics) is an IEEE Future Directions pre-initiative, aimed to review the full lifecycle of electronics, from materials and fabrication through use to end-of-life and reuse. It is relevant to virtually every IEEE Society, Council, and OU, as well as the general research community. The IEEE BENE Workshop is being proposed with a view to build the community, frameworks, tools, and standards needed to make 'responsible electronics' a technically verifiable route for future advances. Goal is not fewer electronic, but better electronics....

**IEEE BENE workshop is structured around six pillars:**



Register for the workshop



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Background Information of IEEE BENE available here: [futuresdirections.ieee.org/events/sensors-bene-workshop](https://futuresdirections.ieee.org/events/sensors-bene-workshop)