SRS-RN: Track 2: Reimagining the Chemical Heartland:
Closing the loop on the oil-plastics-recycling nexus to forge a resilient circular economy

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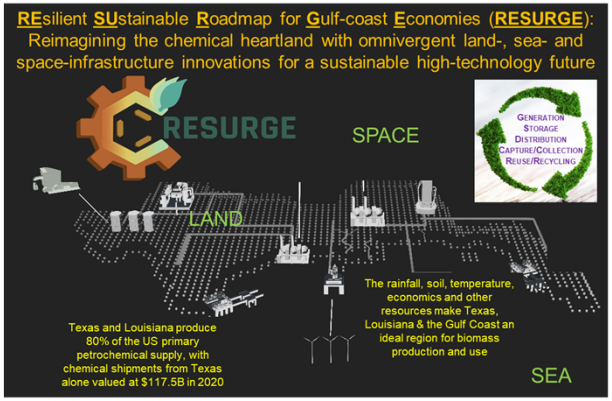
RESURGE: REsilient SUstainable Roadmap for Gulf-Coast Economies

Vision: to address the unique challenges faced by the "chemical heartland" and reimagine how the massive petrochemical infrastructure can be redeployed to foster a resilient, sustainable, and circular economy, as we progress through the energy transition.



Images from canstockphoto.com, cosmeticsdesign.com, dreamstime.com, etsy.com, forbes.com, nasa.gov, oregon.gov
Data from comptroller.texas.gov/economy/economic-data/supply-chain/2021/chem.php
American Chemistry Council, 2021 Guide to the Business of Chemistry

Mission

- To identify fundamental scientific research priorities, technology development gaps, possible policy interventions, workforce development needs, and opportunities for private public partnerships that will allow the region to reinvent itself in the face of impending disruption
- To map materials and energy flows across the Gulf Coast
- To implement a convergent research approach to enable sustainable management of regional inland and coastal water systems

Areas of Research Interest:

Identified through Team-building Workshops & Stakeholder Engagements

- Harvesting Critical Metals during Coincident Water Purification/Desalination
- Biological Systems for Circular Chemical Feedstocks, Bioplastics Production (using metals from Pillar 1, and CO_2 fixation) and Plastic Recycling
- Next Genreation Sustainable, Adaptable, Dynamically-reconfigurable, Infrastructure Materials

Impactful Events

- **RESURGE Team-Building Workshops** fostering collaboration and managing project goals with approximately 20 bi-weekly team meetings and three team-building workshops, on March 25, September 23, and November 18, 2022.
- **SRS-RN Core Team Working Event** brought the grant planning team together to organize and prepare for a thematic stakeholder workshop with the aim of engaging external stakeholders. April 23, 2022.
- **Thematic Stakeholder Workshop**, centered around the theme "Reimagining the Chemical Heartland with Omnivergent Land, Sea, and Space Innovations," engaging key external stakeholders was held on October 14, 2022.

Team-Building Workshop
12-15 core RESURGE Members participated in each team-building workshop.

Team-Building Event & Workshop
Focused on the organization and preparation for a thematic stakeholder workshop.

Thematic Stakeholder Workshop
13 invited speakers presented their insightful discoveries. Approximately 60 attendees participated in the workshop activities. Among them, 20% of the participants were from industry (including entrepreneurial startups to established companies).

Team-Building Workshop
Focused event for Thematic Stakeholder Workshop post-evaluation.

Key Lessons from Rob Keiser (Ørsted Onshore North America, Vice President, Asset Management)
"Our Green Business Transformation. What we did and lessons learned"

- Confront your reality in a changing landscape
- Define a vision
- Engage and align stakeholders
- Mobilize on your vision
- Drive tangible action
- Expect exponential change
- Go the distance

Selected Outcomes/Messages from Stakeholder Engagements

- Pursue active Industry-Academia/Universities collaborations gain partnerships to advance program goals and align with industrial standards and needs
- Prioritize outreach to the general public, current workforce, and policy makers to build an informed support network for program goals.
- Reform curriculum at all levels to address existing deficiencies and fundamentally transforming degree programs and workforce development.
- Promote greater data transparency in industry-originating data, fostering academic-industrial collaborations for data acquisition.
- Foster a thriving start-up ecosystem by nurturing and supporting the establishment of more start-ups centered on technology to address shared goals on sustainability.
- Develop coherent government policies at both the State and Federal levels to incentivize collaboration between academia and industry towards common goals in sustainable technology development.
- Define and secure access to essential technologies and technology partners required to achieve our sustainability goals within the agreed timeline.
- Create opportunities for enhanced industrial collaborations for circular and cascading value chains to reduce waste and enhance supply chain resiliency.

Conclusions & Outlook

RESURGE focuses on fundamental research and development, translation of innovations to practice, education and workforce development within an inclusive innovation ecosystem that aims to harness Gulf Coast regional strengths to address critical challenges sustaining, strengthening, diversifying & growing beyond the current petrochemically-centered chemical manufacturing supply chain.

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