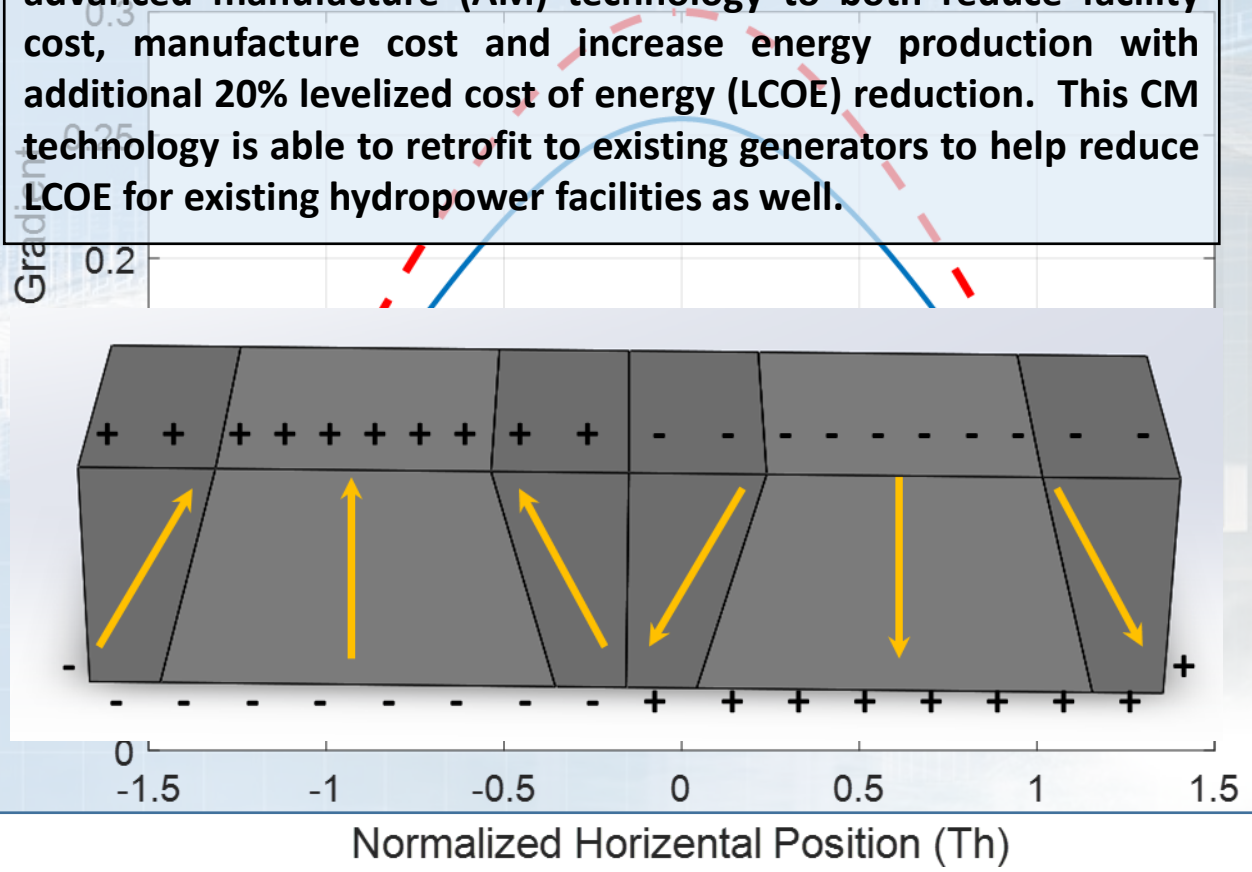
Composite Magnet for Hydropower Generators

Technology Summary

Composite permanent magnet or composite magnet (CM) utilizes modern 3D-permanent magnet materials design to improve hydropower generator energy production for a given form factor. By combining advanced CM design and fabrication process, using advanced manufacture (AM) technology to both reduce facility cost, manufacture cost and increase energy production with additional 20% levelized cost of energy (LCOE) reduction. This CM technology is able to retrofit to existing generators to help reduce LCOE for existing hydropower facilities as well.



Technology Impact

* 3D magnet design has been validated and implemented in various applications and industries for products utilized around the world, such as in magnetic hard disk drive, accelerator and NMR…
* For generators and motors applications, CM provide additional power and efficiency, which requires more complex magnet structure than conventional permanent magnet (PM) structure.
* AM technology coupled with advanced 3D CM technology enable significant reduction in development time, materials waste and time to market, further lowers LCOE.

Team and Technology Background

Team name: Composite Magnet
Lead: Kaizhong Gao, Ph. D.
American Made Network Partner: International Business and Technology Service Corporation
Technology base:

- Composite permanent magnet, K. Z. Gao, patent pending 2020.
- K. Z. Gao et al, US patent 10,714,988, R&D 100 award 2018.
- K. Z. Gao, US patent 8,643,979, current HDD industry standard.