

# ENERGY INNOVATION FORUM

## A solar cell that simultaneously generates and stores electricity

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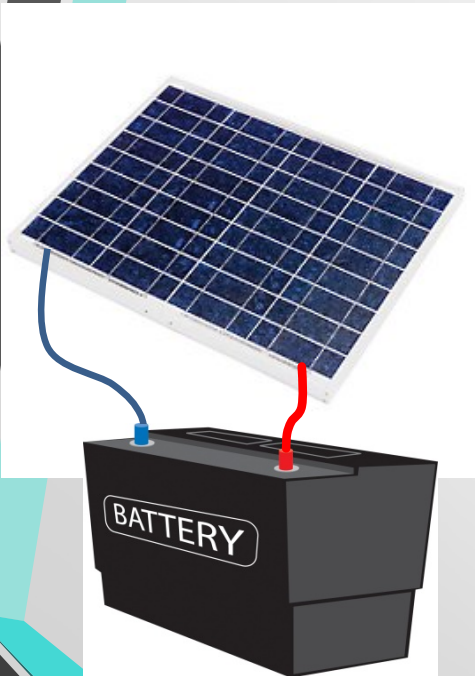
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## Current Solar Energy Market



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- ~ 1 trillion \$ market (battery + solar cell)
- **High** Capital cost
- **High** operating cost
- **Complicated** energy management
- Batteries are **less reliable** due to capacity fade, thermal management, and safety issue.

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## Solar Storage Cells

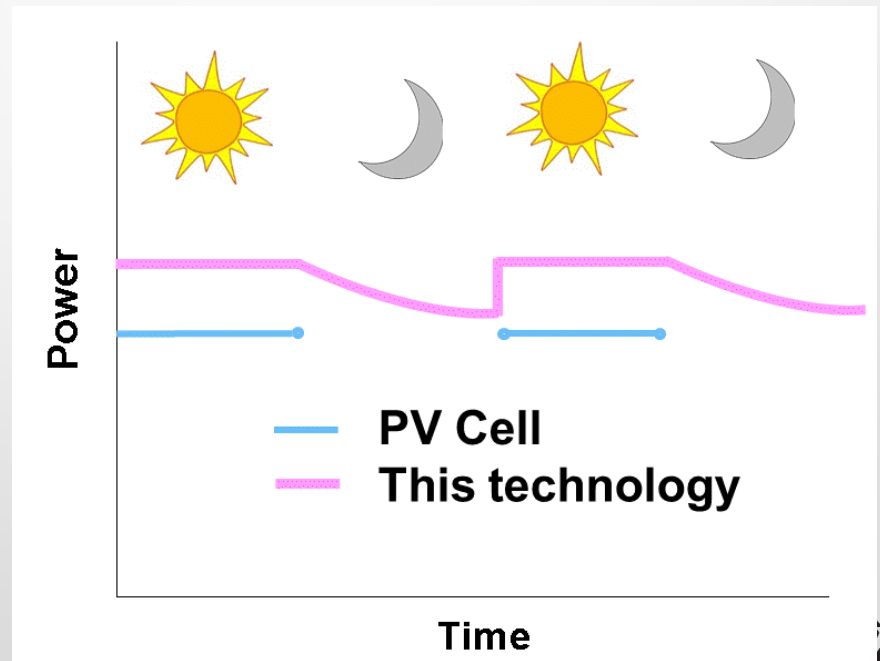


- **Low Capital cost**
- **Low operating cost**
- **Simple** energy management
- Built-in storage.
- Completely replace batteries.

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## All-day solar cell (ADSC)

- **ADSC:** with built-in storage capacity, replacing separate batteries.
- An ADSC simultaneously generates and stores electricity; reduced maintenance
- Continuing discharging at night.
- Improving reliability, availability, and quality.



Time



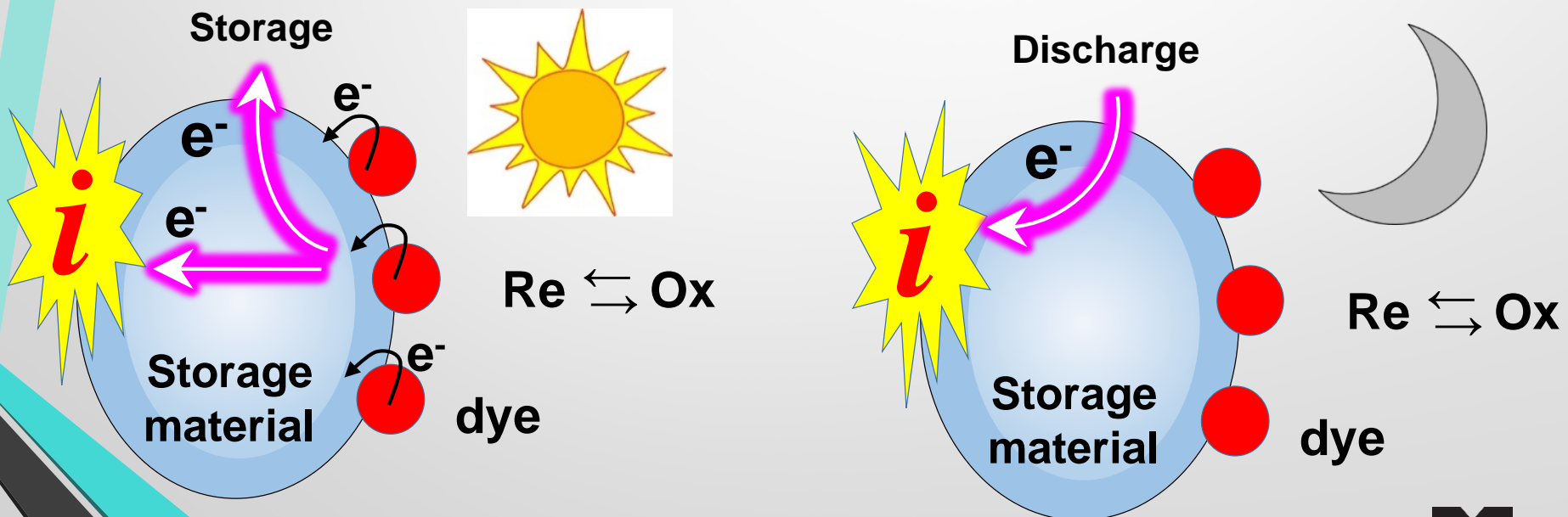
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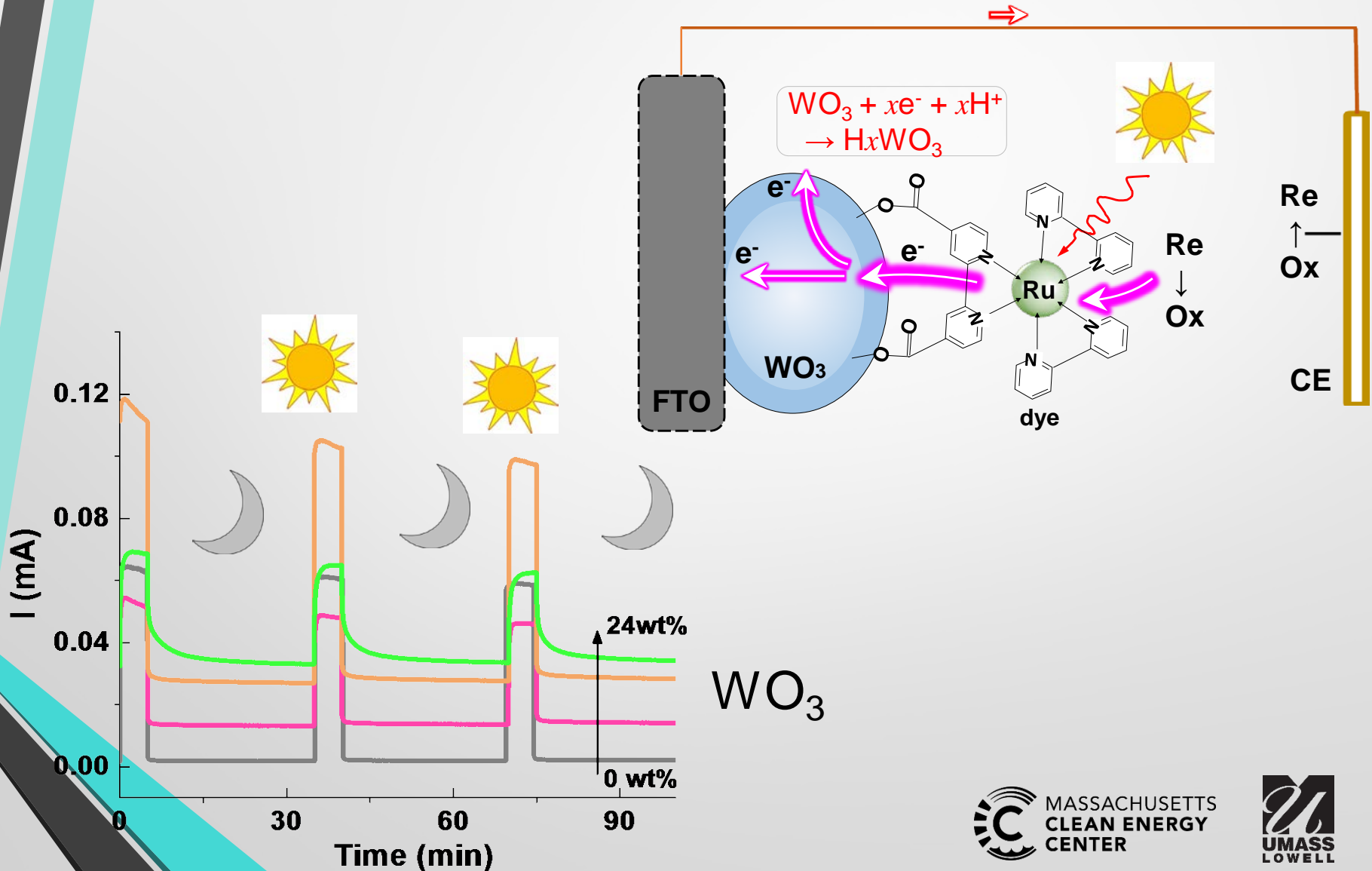
## How the cell works

- Built on DSSC construction.
- **Reversible** photochromic storage mechanism was recently discovered.



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## Proof-of-concept demonstration



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## Summary

- The ADSC is built on DSSC construction, but potentially offers higher efficiency.
- With inherent storage capability, further development of the ADSC could
  - completely replaces rechargeable batteries;
  - does not need charge/discharge switches;
  - Is ideal for bridging power and short-term variability (due to weather or demand);
  - To address daily variations (discharges at night up to 4 ~5 hours);
  - Has low capital/operation cost;
  - reduces EPBT by > 5x.