



Kane County

KC Energy and Environmental Committee

Government Center
719 S. Batavia Ave., Bldg. A
Geneva, IL 60134

Agenda

BATES, Tarver, Allan, Kiouss, Roth, Strathmann, Young, ex-officio Pierog (County Chair) and
Tepe (County Vice Chair)

Friday, July 14, 2023

9:00 AM

County Board Room

1. **Call To Order**
2. **Roll Call**
3. **Remote Attendance Requests**
4. **Approval of Minutes: June 16, 2023**
5. **Public Comment (Agenda Items)**
6. **Environmental (J.Wollnik)**
 - A. **Resolution:** Authorizing a Budget Adjustment for Sustainability Manager Salary for the Department of Environmental & Water Resources
7. **Recycling/Solid Waste (C. Ryan)**
 - A. Recycling Options: Solar Panels and Lithium-ion Batteries
8. **Sustainability (J.Wollnik)**
 - A. Sustainability Update Presentation
 - B. Tree Protection Ordinance Update, Karen Miller
9. **New Business**
10. **Chairs Comments**
11. **Reports Placed On File**
12. **Executive Session (if needed)**
13. **Open Session**
 - A. Vote on Release of Closed Session Minutes
14. **Public Comment (Non- Agenda Items)**
15. **Adjournment**

SS.

RESOLUTION NO. TMP-23-920

WHEREAS, the Sustainability Manager (formerly known as the Resource Management Coordinator) is a critical County position in both obtaining grant funds for the County and saving significant operation costs by way of energy efficiency improvements and lower energy costs; and

WHEREAS, the 2 MW solar facility being constructed at the Judicial Center will save the County \$200,000 per year for the next 25 years and an additional \$286,000 in grant funds will be coming to the County in 2024, both are a direct result of this position; and

WHEREAS, we have interviewed candidates for the position and have made a contingent offer to one of the candidates with a very strong history in sustainability and obtaining grant funding for an annual salary of \$80,000 which will require a budget adjustment approved by the Board.

NOW, THEREFORE, BE IT RESOLVED by the Kane County Board that the Department of Environmental & Water Resources FY 2023 budget be adjusted to reflect the Sustainability Manager salary (formerly the Resource Management Coordinator) of \$80,000

\$13,900	001.670.692.4000	Gen Fund, Env. Management, Water Resources, Salaries & Wages
(\$13,900)	001.900.900.85000	Gen Fund, Contingency

Line Item: 001.670.692.40000

Line Item Description: Gen Fund, Environmental Management, Water Resources, Salaries & Wages

Was Personnel/Item/Service approved in original budget or a subsequent budget revision? No

Are funds currently available for this Personnel/Item/Service in the specific line item? No

If funds are not currently available in the specified line item, where are the funds available?

001.900.900.85000 Gen Fund, Contingency

Passed by the Kane County Board on August 8, 2023.

John A. Cunningham
Clerk, County Board
Kane County, Illinois
Vote:

Corinne M. Pierog MA, MBA
Chairman, County Board
Kane County, Illinois



RESOLUTION / ORDINANCE EXECUTIVE SUMMARY ADDENDUM

Title

Authorizing a Budget Adjustment for Sustainability Manager Salary for the Department of Environmental and Water Resources

Committee Flow:

Energy and Environmental Committee, Finance and Budget Committee, Executive Committee, County Board

Contact:

Jodie Wollnik – 630-232-3499

Budget Information:

Was this item budgeted? No	Appropriation Amount: \$13,900
If not budgeted, explain funding source: General Fund Contingency	

Summary:

A Resolution for a budget adjustment for hiring the replacement for Ivy Klee as Sustainability Manager.

STATE OF ILLINOIS)

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COUNTY OF KANE)

PRESENTATION/DISCUSSION NO. TMP-23-949

RECYCLING OPTIONS: SOLAR PANELS AND LITHIUM-ION BATTERIES



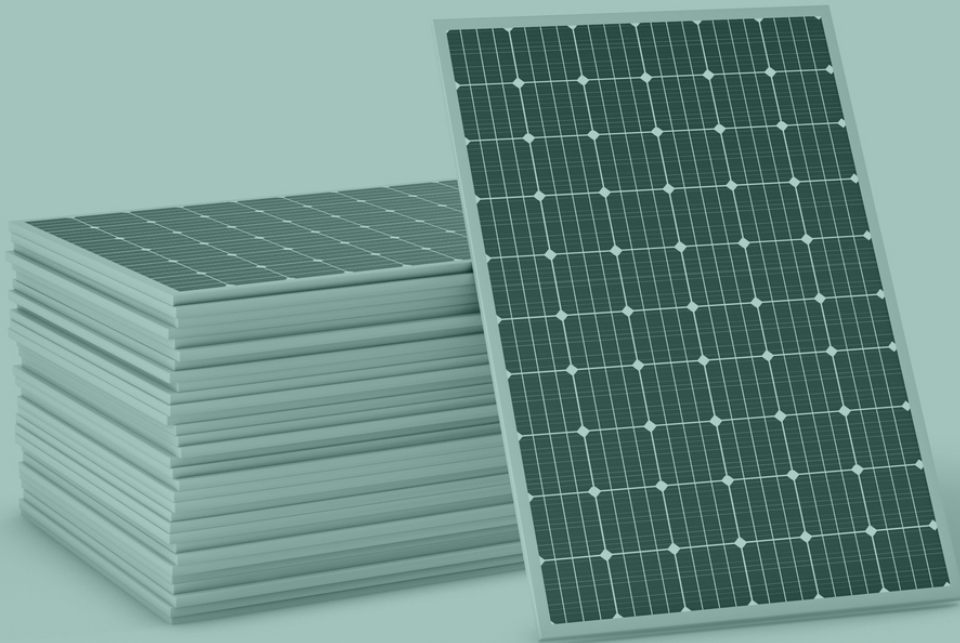
Recycling Options: Solar Panels & High- Capacity Lithium-ion Batteries

KC E&E Committee, July 14, 2023



Clair Ryan

Kane County Recycling Coordinator
recycle@countyofkane.org



All Large-Scale Electrical Generation Results in Waste

Coal → GHGs, NO_x & SO_x, mine drainage, fly ash, bottom ash, other ashes & sludges, decommissioned combustion equipment

Natural Gas → GHGs, NO_x, VOCs, radioactive material (TENORMs), decommissioned combustion & transmission equipment

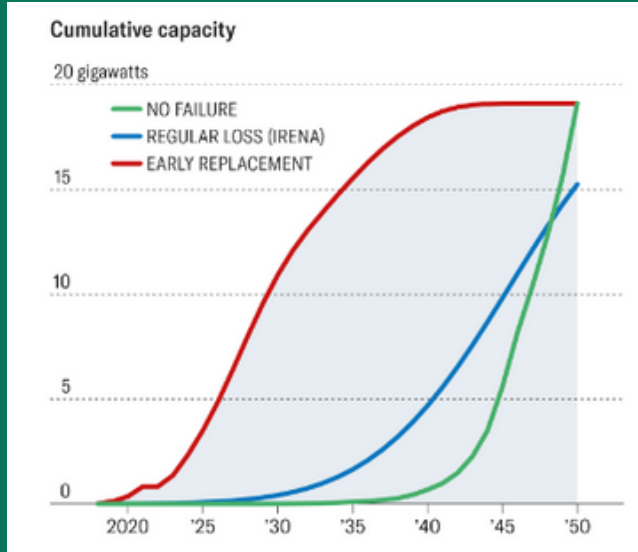
Nuclear → Pit tailings, spent fuel rods, contaminated water, decommissioned equipment

Hydro → Reservoir sediments, decommissioned dams

Wind → Decommissioned turbine blades, decommissioned energy storage

Solar → Decommissioned panels, decommissioned energy storage

Anticipated Waste Solar Panels

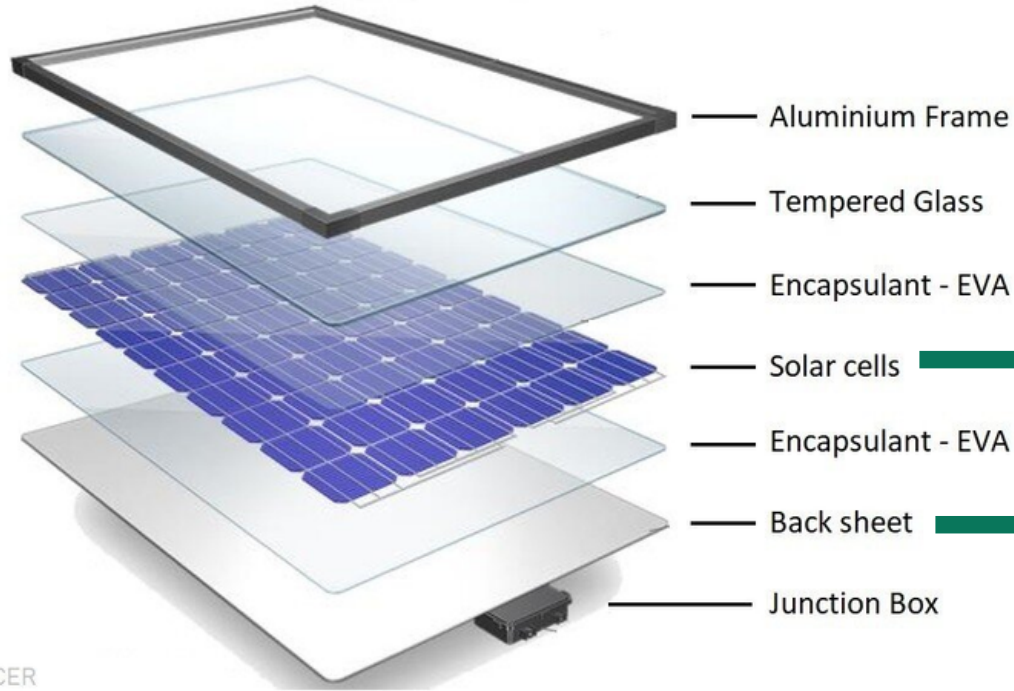


The Solar Trash Wave

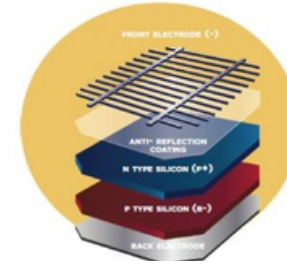
According to our research, cumulative waste projections will rise far sooner and more sharply than most analysts expect, as the below graph shows. The green “no failure” line tracks the disposal of panels assuming that no faults occur over the 30-year life cycle; the blue line shows the official International Renewable Energy Agency (IRENA) forecast, which allows for some replacements earlier in the life cycle; and the red line represents waste projections predicted by our model.

Source: Atalay, A., Duran S., L.N. Van Wassenhove. 2021. The dark side of solar power. Harvard Business Review.
<https://hbr.org/2021/06/the-dark-side-of-solar-power>

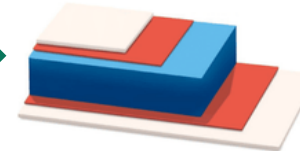
Anatomy of a Solar Panel



EVA = ethylene vinyl acetate resin
Tedlar = PVF = polyvinyl fluoride
PET = polyethylene terephthalate

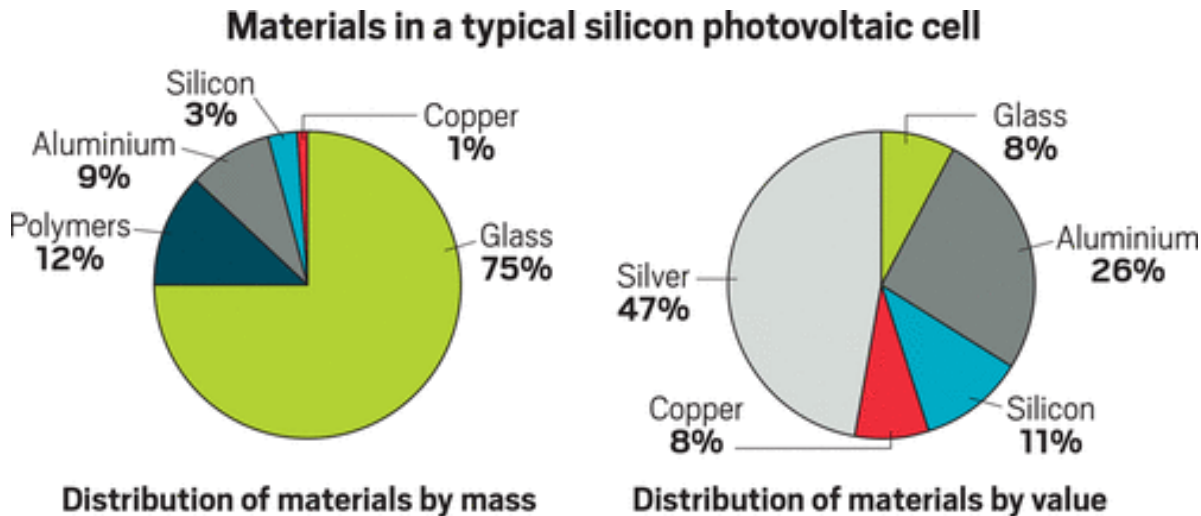


Crystalline silicone (x2)
Electrodes (Ag, Al, Cu)
Solder (Pb)



1. Tedlar
2. Adhesive
3. PET
4. Adhesive
5. Tedlar





Economic Headwinds to PV Recycling



Source: Martin Bellman/Icarus. **Note:** Silver is less than 1% of the mass.

"Two-thirds of the value in less than 5% of the weight"
Currently, ~10% of decommissioned solar panels are recycled.

Unmaking the Sandwich

-  All methods: Remove aluminum frame and junction box
-  Method 1: Physical - crush/grind panel and use sieving, floatation, electrostatic separation, and currents to piece out valuable components
 - Yields are relatively impure
 - Many recyclers don't bother with secondary processing, so the yield is low grade glass cullet
-  Method 2: Chemical - Use solvents to dissolve adhesives & polymer resins, enabling separation and recovery of glass and metals
 - Expensive and slow with organic solvents
 - Generates hazardous waste
-  Method 3: Heat - Use extremely high temps to break polymers and separate materials
 - Backsheet is removable, in reusable condition, after 5 minutes at 150 degrees Celsius
 - EVA depolymerization at 500 degrees Celsius, yielding in-tact glass panel and silicone wafers
 - Expensive/energy intensive

Unmaking the Sandwich, cont.

Method 4: Hybrid

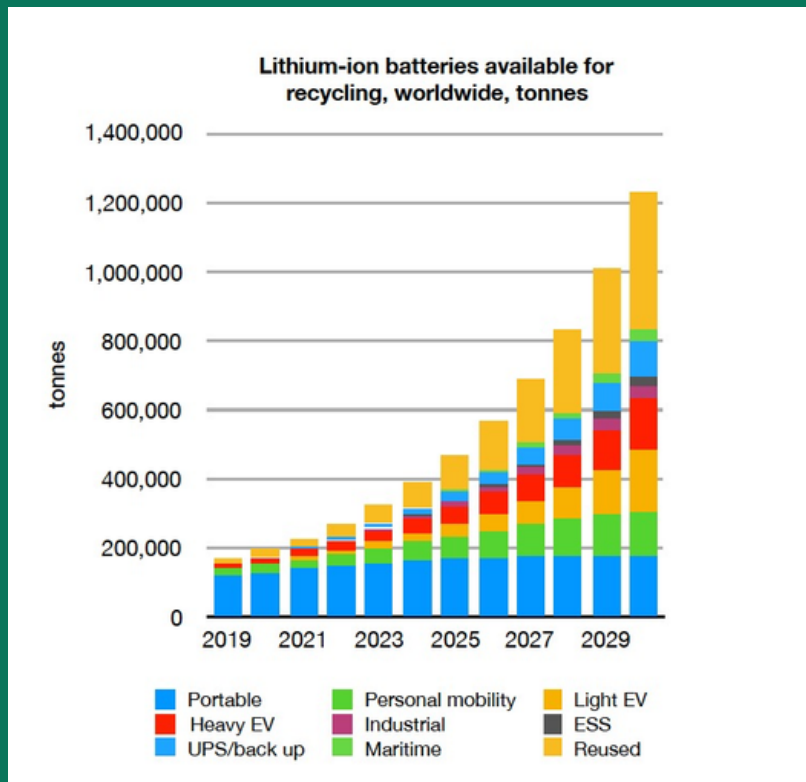
- Use infrared heating and vibrating knife machine to cut the glass off & process for recycling
- Crush/grind and incinerate the remainder to break polymers
 - Crushing reduces size requirement of pyrolysis unit
- Use sieving, acid leaching and electrolysis on the resultant bottom ash to recover & separate silicone wafer and metals (Al, Ag, Cu)
 - Requires significantly smaller amount of toxic solvent than fully chemical separation

- ## The EU is funding and piloting the vast majority of crystalline silicone photovoltaic cell recycling
- US efforts have focused on cadmium telluride cells a.k.a. thin-film cells
 - Non-hazmat landfilling in the US is relatively inexpensive (especially in the Midwest)
 - With existing resources, recycling a standard photovoltaic cell costs ~\$23 and yields \$3-5 in commodities (net loss of \$20/cell) while landfilling costs \$1-2 per cell
 - Illinois' existing MSW landfill capacity is ~20 years at the current rate of waste generation
 - Mass-retirement of solar cells would increase disposal volumes

Government Role in Solution?

- ♻️ Extended Producer Responsibility laws requiring panel manufacturers to fund recycling
 - Washington State passed EPR for solar in 2017
 - Implementation begins 2025
- ♻️ The U of I Illinois Sustainable Technology Center (ISTC) is investigating options with a focus on salvage/refurbishment/reuse of sub-optimum equipment

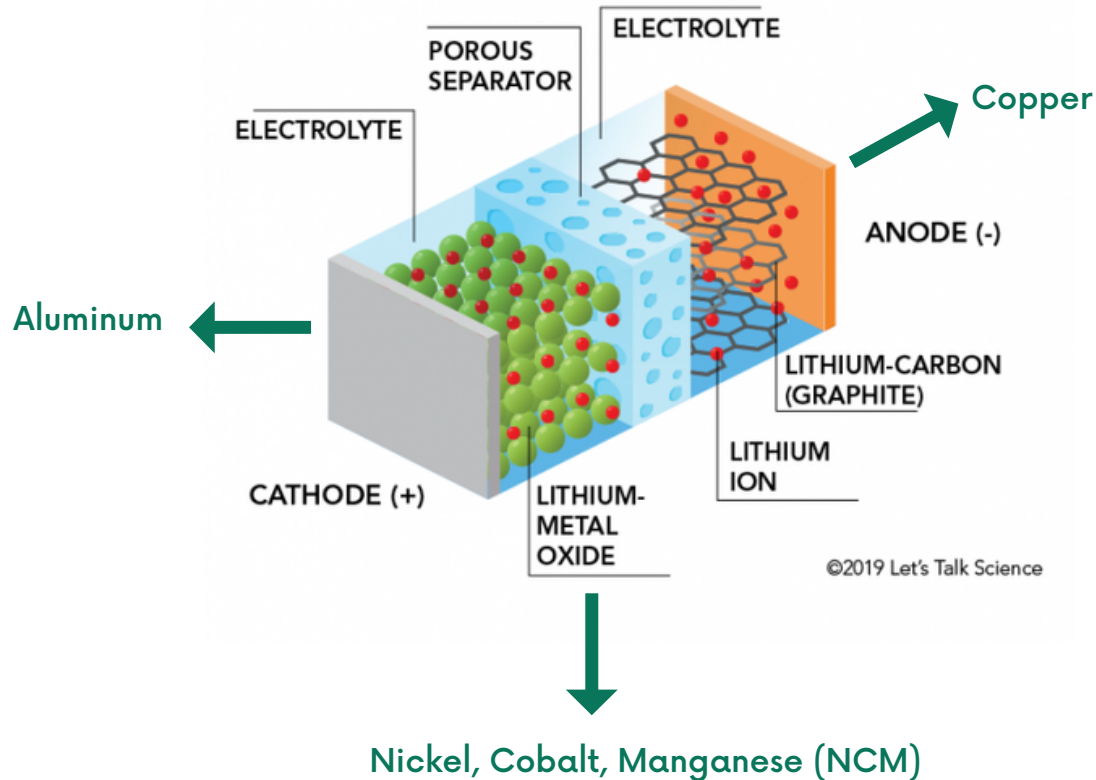
Anticipated Waste Li-ion Batteries



Source: Circular Energy Storage
Research and Consulting

Production scrap is a key, unaccounted
for resource in current operations

Anatomy of a Lithium Ion Battery



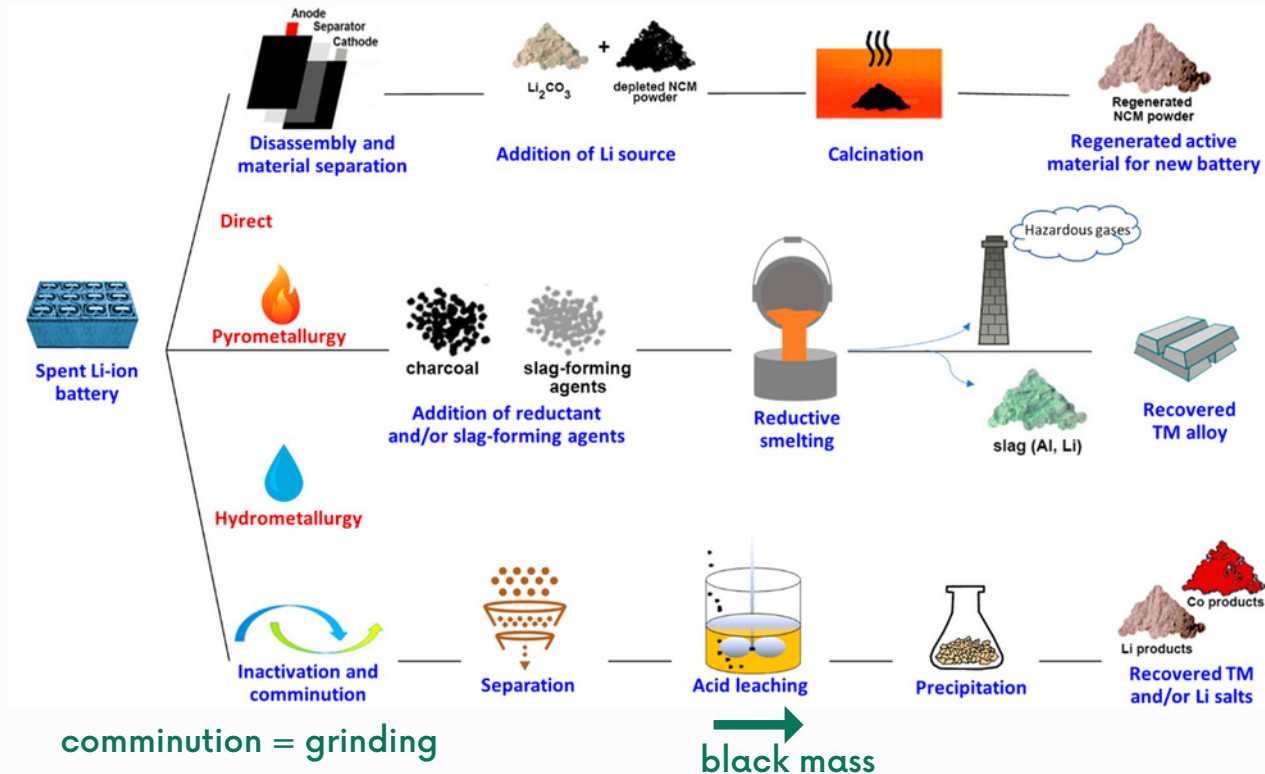
Economic Headwinds to Li-ion Battery Recycling:

- ♻️ Supply <<< Demand for recycling at scale
 - The most readily available batteries (consumer electronics) are hardest to collect & recover
 - The largest batteries are often recovered for secondary uses (EV --> Energy Storage System)
- ♻️ Design inconsistencies between manufacturers
- ♻️ Competition with other global economic superpowers
- ♻️ Potential for short circuiting and resultant thermal runaway reactions during transport, storage or processing increases liability at every step
- ♻️ Current estimate that 5% of post-consumer Li-ion batteries are recycled globally



Scott Olsen/Getty Images

Common Li-ion Battery Processes



NCM = nickel, cobalt, manganese

TM = transition metal

Government Role in Solution?

- ♻️ Extended Producer Responsibility laws requiring battery manufacturers to fund recycling
 - Four states + Wash. D.C. have modern EPR laws that cover small Li-ion batteries
 - Most don't cover e-mobility batteries and none cover EV batteries
 - Most don't cover embedded batteries not designed to be removed
 - All utilize cost internalization rather than fees
 - Two include funding some costs of collection, which can be substantial assuming collection staff are responsible for sorting and packaging for shipment
 - All include funding outreach and education
 - Two require changes in labeling
- ♻️ The U of I Illinois Sustainable Technology Center (ISTC) is coordinating with in-state stakeholders on EV/large capacity battery solutions, including auto-salvage operations, local governments, utilities to improve guidance and access to resources



Questions?

Discussion?



Program Announcement - New Kiosk

New self-service "bits and pieces" kiosk @ Fabyan, now accepting:

- Ink jet cartridges
- Multi-beverage holders (can caddies + plastic rings)
- Eyeglasses & hearing aids
- Small & dry art materials

Open to ideas of other materials

- Small
- Safe
- Not temperature sensitive



Program Announcement - Extravaganza!

Saturday, July 22nd, 540 S. Randall Road, 8am - noon

- Fluorescent tubes, bulbs, LEDs
- Electronics, clothing and textiles, cardboard
- Books
- Bicycles + accessories
- Styrofoam
- Aerosols, small compressed gas cylinders, car seats
- Latex paint
- Batteries
- NO SHREDDING...

EEC Volunteers Welcome and Appreciated!



Program Announcement - Electronics Program

We were assigned a new recycler (MRM) by the Illinois Electronics Clearinghouse (the Producer Responsibility Organization) as part of the opt-in for the 2024 CERA program year

eWorks has worked with MRM before and anticipates being able to continue acting as Kane County's electronics collector (i.e., we don't anticipate changes at the sites)

Will introduce a resolution with MOU between Kane Co., eWorks and MRM by September



STATE OF ILLINOIS)

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COUNTY OF KANE)

PRESENTATION/DISCUSSION NO. TMP-23-934

SUSTAINABILITY UPDATE PRESENTATION

Sustainability Program Updates



E&E Committee Meeting, Friday, July 14, 2023

Presented by Jodie Wollnik

Judicial Center Solar Project

- ComEd to confirm shutdown date.
- Team with Judicial and Sheriff's Office to confirm shutdown dates and procedures.
- Building Management to verify generator and have staff available to re-set equipment.
- Third party inspector will be present at shutdown.







Save on a solar installation

Register to receive a discounted offer for a complete solar installation.

SOLARSWITCH.COM/KANECOUNTY



QUESTIONS?

CONTACT: COURTNEY MEYER AT
630-232-3497



[Solar Switch US](#) | [Facebook](#)

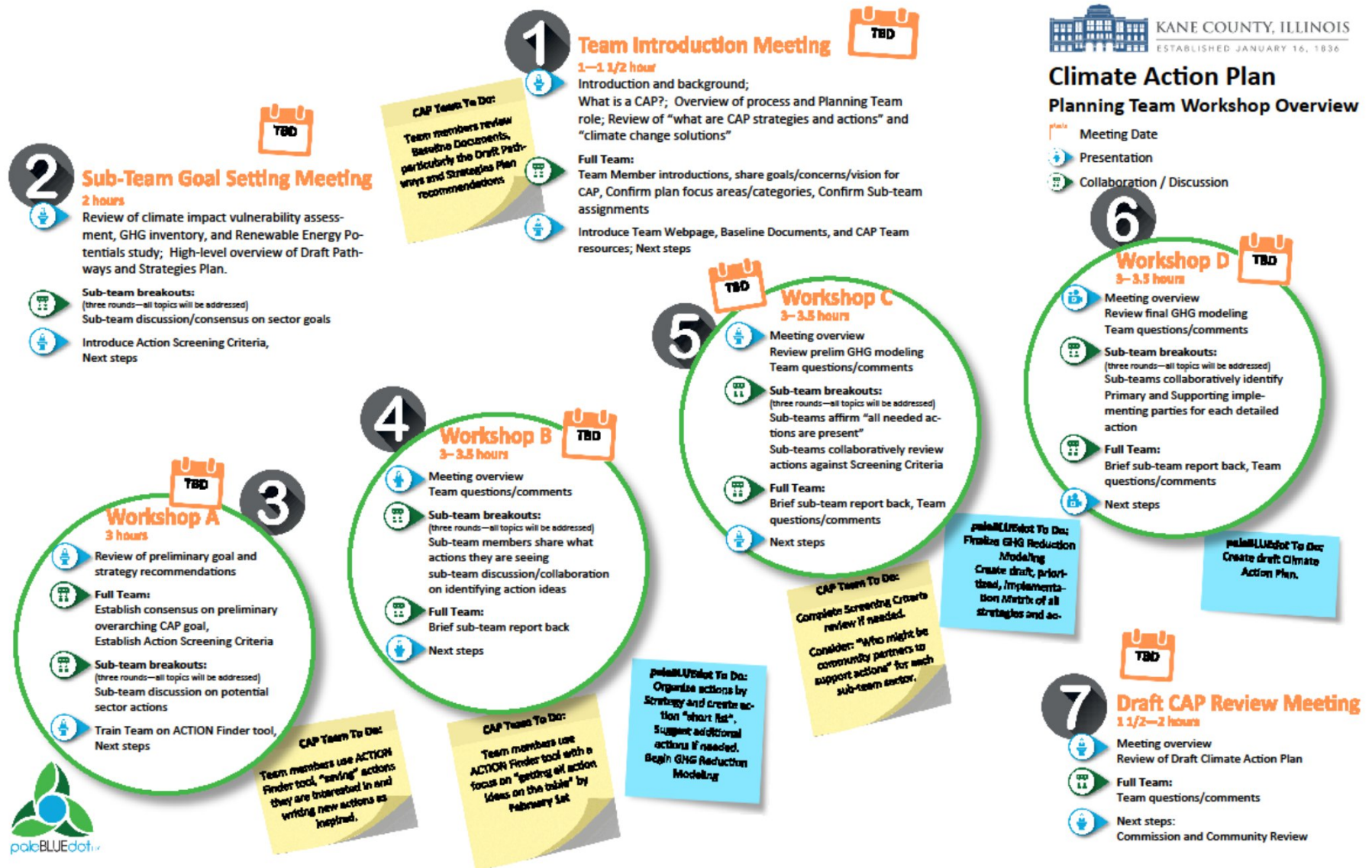
Climate Action Implementation Plan

- Sub-Team meeting scheduled for July 20th, in preparation, each team member will review the recommendations draft report for their sections as a starting point for a more detailed discussion on the 20th
- Team members will work collaboratively to co-create the County's plan by exploring, creating, reviewing, refining, and supporting the prioritization of actions to achieve the County's climate goals.
- Community Survey is will open until September 1st, so please continue to forward the link to anyone interested in taking the survey <https://palebluedot.llc/kane-climate-action>.
- Work together through a series of 7 or 8 workshop meetings beginning June 2023 and continuing through December/January 2023. Team members will also be asked to complete tasks between workshop sessions.



Climate Action Plan Planning Team Workshop Overview

- Meeting Date
- Presentation
- Collaboration / Discussion



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PRESENTATION/DISCUSSION NO. TMP-23-985

TREE PROTECTION ORDINANCE UPDATE, KAREN MILLER