# SAG LIAISON CALL
# July 26, 2016

# SAG July Liaison Call agenda:

1. Randy Fish, Energy Storage
2. Dave Gardin Chapter Sustainability Representative: St. Louis
3. Eric Teicholz, Bill Conley, SAG/ESUS Update

# International Facilities Management Association
# Sustainability Liaison Webinar

## *A Primer on Energy Storage*

STRATEGEN
STRATEGIES FOR CLEAN ENERGY

**Randy Fish, Consultant**

**July 26, 2016**

# Corporate Overview

## Strategen Consulting

- Consulting in renewables & energy storage since 2005
- Unique focus in strategic advisory work in the clean energy industry

## California Energy Storage Alliance (CESA)

- 501(c)(6) founded in January 2009
- 80+ member companies
- Active in 20+ regulatory proceedings at CPUC and CAISO, as well as State Legislature

## Energy Storage North America (ESNA)

- Largest storage conference in NA (1800+ attendees)
- 42 countries in attendance, 100+ exhibitors
- Next event: October 4-6, 2016 San Diego Convention Center

## Global Energy Storage Alliance (GESA)

- 501(c)(3) founded in January 2014
- Identifies and promotes international best practices

# Overview

## Energy Storage 101

- Technologies
- Grid Locations
- Distributed Applications & Value Streams
- Case Studies
- Financing
- Energy Storage North America

# Technologies

**Electro-Chemical Storage**

*(Flow battery / Lithium Ion)*

**Mechanical Storage**

*(Flywheel)*

**Bulk Mechanical Storage**

*(Compressed Air)*

**Thermal Storage**

*(Ice / Molten Salt)*

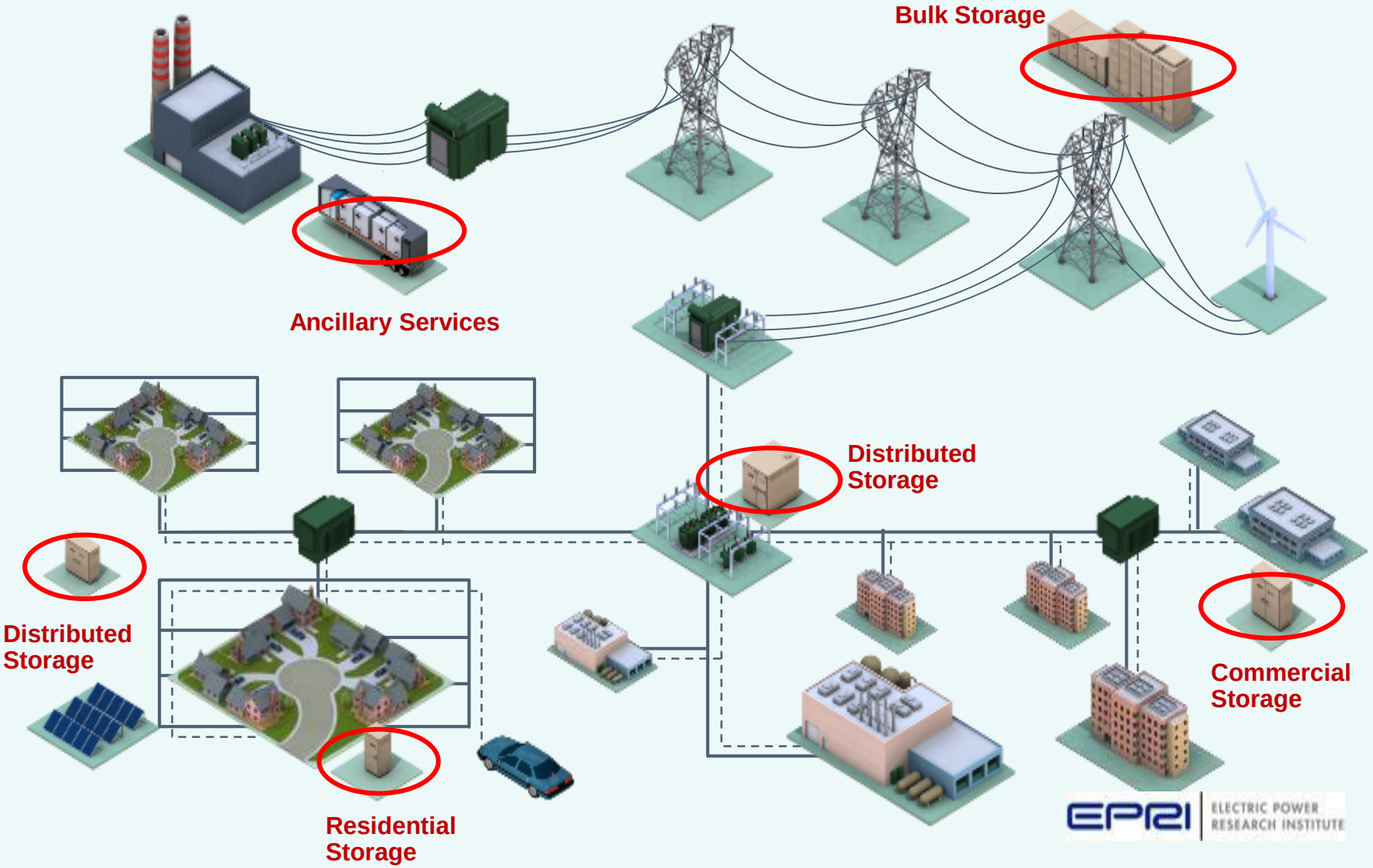
**Bulk Gravitational Storage**

*(Pumped Hydro)*

**Transportation**

*(Electric Vehicles)*

# Grid Locations



# Customer Sited Applications

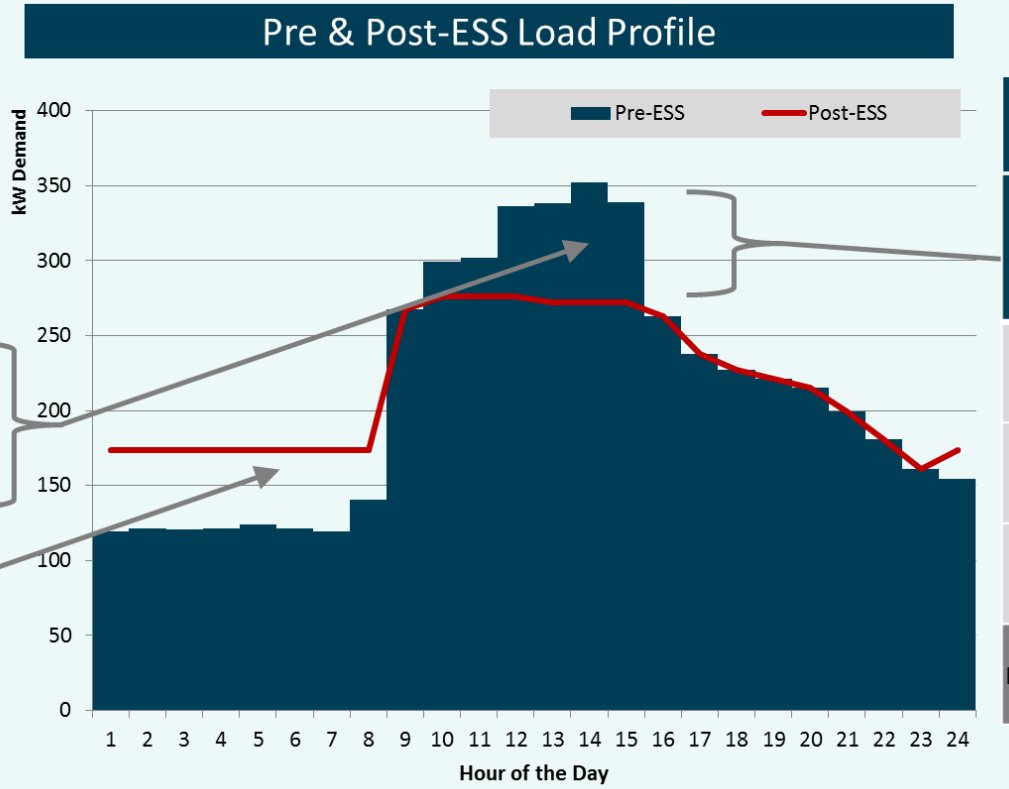
| | |
|---|---|
| **Demand Side Permanent Load Shifting** | Permanent Load Shifting - electric |
| | Business Customer, Building Thermal Mgt. |
| **Bill Management & Demand Response** | Business Customer, Peak/Max Demand Mgt. |
| | Residential Customer, TOU Bill Management |
| | Residential Customer, Solar Integration and bill management |
| | Aggregated C&I / VNM Solar + Storage |
| | Multi-family Residential, Solar and Demand Mgt. |
| **Bill Management + Market** | Business Customer, Bill + Market Participation |
| | Residential Customer, Bill + Market Participation |
| **Utility Controlled** | Grid Operation Benefits |
| **Reliability** | Storage to provide reliability and aggregated market services |
| | Storage to provide reliability and DR |
| **EV Charging** | EV Charging, Public Charging Station |
| | EV Charging, Commercial or Municipal Fleet |
| | EV Charging, Residential Home |
| | Solar + Storage + EVs with bidirectional mkt participation |
| | Storage + Evs with bidirectional mkt participation |
| | EV Aggregated Charging with Market Participation (V1G) |
| | EV Aggregated Charging/Discharging with Market Participation (V2G) |

# Example: Commercial Electric Bill Management

## Energy storage system reduces end-customer demand and energy charges

**Annualized Energy Savings**

| Time of Use | kWh Avoided | Total Savings |
|---|---|---|
| On-Peak Discharge | 19,715 | **$2,539** |
| Mid-Peak Discharge | 35,391 | **$2,884** |
| Off-Peak Charge | (77,496) | **$(4,794)** |
| Total | (22,391) | **$629** |




**Annualized Demand Savings**

| Time of Use | kW Avoided | Total Savings |
|---|---|---|
| Anytime | 160 | **$14,956** |
| On-Peak | 120 | **$6,626** |
| Mid-Peak | 160 | **$1,027** |
| Max or Total | 160 | **$22,609** |

**Note that savings is very dependent on facility load profile and electric tariff**

# Case Study: Santa Rita Jail

- One of the largest US correctional facilities
- 3 MW average daily peak demand
- Existing microgrid allows islanding from utility indefinitely
  - Includes 1.5 MW PV, 1 MW fuel cell, and diesel generators

Since installing 2 MW/ 4 MWh energy storage system (ESS) in 2012, facility has:

- Saved $100,000 annually on electricity costs
- Reduced demand charges
- Performed microgrid balancing solely with ESS
- Bolstered security and reliability of power supply

More info: https://building-microgrid.lbl.gov/santa-rita-jail

# Case Study: Walmart Solar Plus Storage Systems

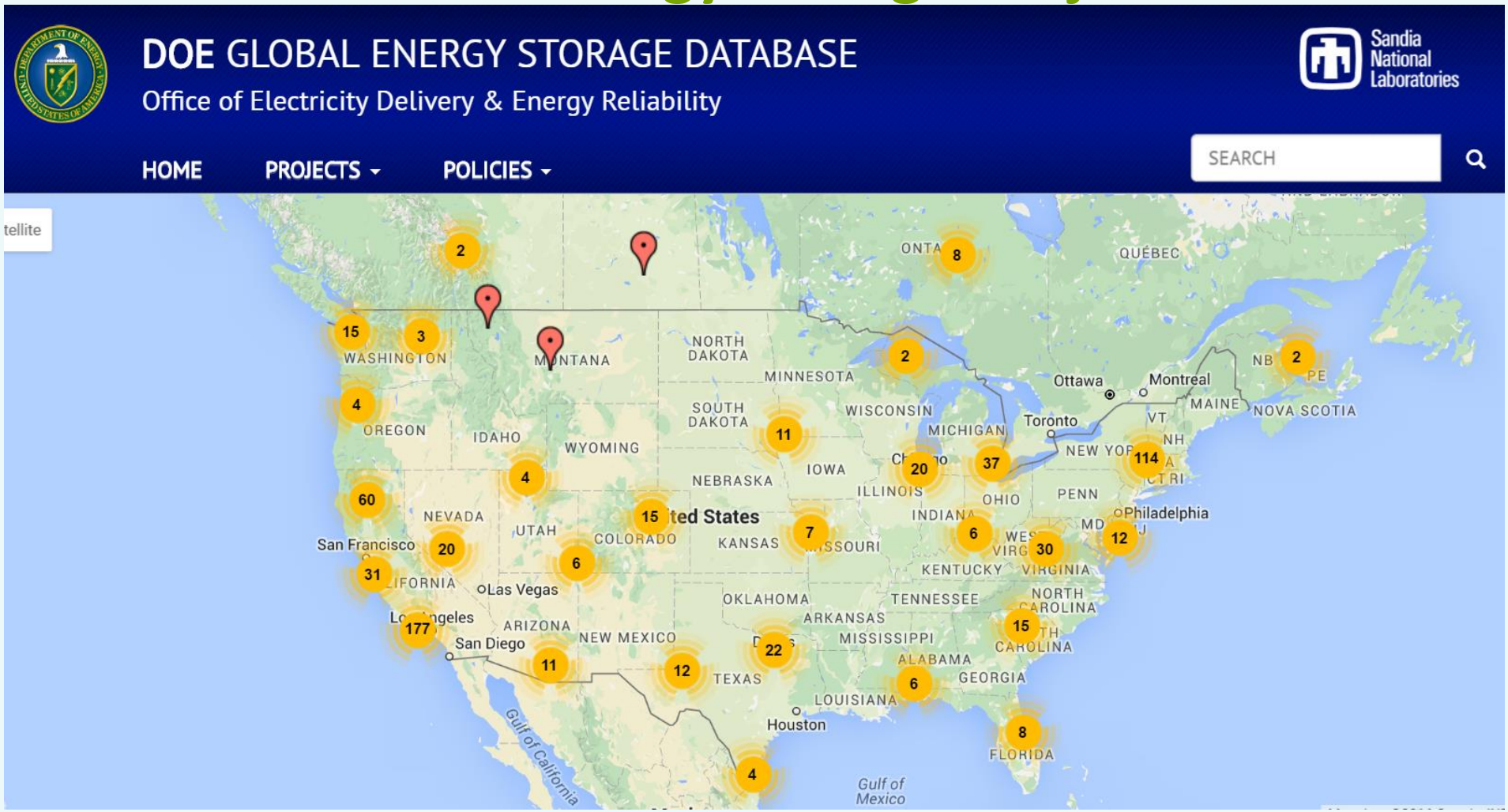
- SolarCity is pairing solar and storage on 23 Walmart stores nationwide
- 200 kw / 400 kWh battery systems
- Two Primary Applications:
    1. Peak load reduction
    2. Backup power

More info: http://www.solarcity.com/newsroom/press/solarcity-announces-new-solar-power-and-energy-storage-projects-walmart

# Building Case Study: Rockefeller Center

- CALMAC Thermal Storage
- Ice-making chiller supplies 8,600 ton-hours of energy storage
- During heavy cooling demand, ice cooling supplements chiller, thereby:
    1. Offering flexibility to system operator
    2. Allowing real-time optimization of cooling plant efficiency
    3. Reducing peak energy demand
    4. Reducing energy and demand costs

# DOE Database of Energy Storage Projects & Policies




www.EnergyStorageExchange.org

# Financing

| Type | Cash | Lease | Shared Savings |
|---|---|---|---|
| **Description** | Upfront purchase | Term | Developer owns asset & savings are shared |
| **Pros** | Capture 100% of system savings | No upfront cost | No upfront cost, no risk |
| **Cons** | Technology & performance risk | Performance risk (high downside risk) | Shared savings |

- Storage qualifies for Federal Investment Tax Credit (ITC) if sited with and charged by renewables (some conditions apply)
- Incentive programs in California and New York offset CAPEX
- State grants for pilot projects (esp. for resiliency and critical infrastructures)

Chart adapted from Green Charge Networks

# Key Takeaways

Storage is cost-effective today for many applications and can:

- Save facilities money and potentially generate revenue
- Firm and store onsite renewable generation
- Provide flexibility and allow building optimization
- Increase resiliency and backup capabilities

It's a win-win-win for Customers, Utilities, and the Grid!

- **2000+ energy storage policy, technology & market leaders**
- **Energy users and managers from across North America**
- **Full day of commercial and industrial storage case studies and best practices**
- **Speakers include facility managers and planners from:**
  - Walmart
  - Marine Corps Miramar
  - Alameda County
  - OATI Data Center
  - City of San Diego
  - LINC Housing
  - College of Marin
  - SF Dept. of Environment

Keynote Address

*October 5th, 9:15am – 9:45am*

How Storage is Enabling the World's Largest Retailer to Achieve its Clean Energy Goals

Mark Vanderhelm,
VP of Energy, Walmart

*Special Offer:* Attend ESNA's C&I track on October 5 for free (a $695 value) with code ESNA16IFMA - http://esnaexpo.com/attendees/registration

- **IFMA World Workplace attendees can engage with over 100 exhibitors at ESNA's Expo Hall for free**

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Thank you!

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## Chapter Presentations:

- 1. How is sustainability group organized in your chapter (a bit about chapter size/organization)
- 2. Primary sustainability activities chapter is are involved with
- 3. What's on your web (and URL)
- 4. Wish list? what else is chapter interested in, needs not being met, potential role of IFMA national
- 5. Contact info for you as sustainability liaison

## Dave Gardin,
## Chapter Sustainability Representative, St. Louis

**1. How is sustainability group organized in your chapter (a bit about chapter size/organization)**

- **Board Level Sustainability Liaison Position and Education Chair position (SFP)**

# 2. Chapter Sustainability Activities

- Annual tradeshow with BOMA and IREM
- St. Louis High Performance Building Challenge
- Incorporating sustainability topic into monthly meeting
- City of St. Louis – City Energy Projects
- Benchmarking classes
- Sponsor of the St. Louis High Performance Building Initiative

## 3. What else is the chapter interested in, what needs are not being met or what could be a potential role in IFMA national?

- Green Leasing (from tenant perspective)
- Metering best practices
- Educational opportunities on updated building codes and inclusion of more modern energy practices into building codes – perhaps something on the role of building codes?

# Contact Information

- St. Louis Chapter website: http://ifmastl.org/index.php
- Sustainability Liaison, David Gardin - davegardinhvac@gmail.com
- Chapter Past President, Chris Laughman – Christopher.laughman@stls.frb.org

ESUS/SAG Updates: Bill Conley and Eric Teicholz

# 2016 Webinars:

**Jan 21 Sustainable Procurement**

**Feb 17 ENERGY STAR (Guide Webinar)**

**Mar 8 Getting Started (Guide Webinar) – confirmed (178 registrants)**

**May 18: 12 PM Central: Measuring and Reporting (Guide Webinar)(375 registrants)**

**Jun 22: Waste Disposal (Guide)**

**Jul 13: Voice of the Tenant/Tenant Star (with EPA)**

**July 13: Engaging Tenants in Energy Efficiency – Cindy Jacobs, EPA**

**https://attendee.gotowebinar.com/recording/4255201634878825987**

**Sep 7, 12 PM Central: Resilience Planning for Facility Managers Dr. Sarah Slaughter, MIT, BICE,**

**Oct: WWP, no webinar**

# Webinar URLs>KL

2015

- Mar 24, Emissions: https://attendee.gotowebinar.com/recording/1261714147782873089
- May 19: Guide Updates: Green Rating Systems, Lighting, ENERGY STAR: https://attendee.gotowebinar.com/recording/9191569029629882114
- July 21: Sustainability Update, Electric Vehicles, LEEP Initiative https://attendee.gotowebinar.com/recording/8340132517873276417
- Oct. 29: Occupant Engagement (panel) : https://attendee.gotowebinar.com/recording/5725472975881027585

2016

- Jan 21 Sustainable Procurement: https://attendee.gotowebinar.com/recording/4973828137377506306
- Feb 17 ENERGY STAR - https://attendee.gotowebinar.com/recording/8637296428037464835
- Mar 8 Getting Started - https://attendee.gotowebinar.com/recording/6074554726479061505
- May 18: 12 PM Central: Measuring and Reporting - https://attendee.gotowebinar.com/recording/4662997302282251010
- Jun 22: Waste Disposal (Guide)
- https://attendee.gotowebinar.com/recording/2311727970939962628
- Jul 13: Voice of the Tenant/Tenant Star
- https://attendee.gotowebinar.com/recording/4255201634878825987

# How-to Guides

**Updates Completed in KL**: Lighting, Green Rating Systems, ENERGY STAR, Waste, Occupant Engagement,Carbon Footprint

**16 Updates Moved to Knowledge Library With Metadata**:

**Status of Guide Updates**:

1. Getting Started (in process)
2. Carbon Footprint (done)
3. U.S. Government Policy  Commissioning (in process)
4. *Data Centers*
5. *Landscaping*
6. *Water*
7. *Low Cost/No Cost Energy Savings*
8. *Food Service*
9. ENRGY STAR (done)

*Italics =*
*No update*
*author found yet*

# Guides- cont.

10. Green Rating Systems (done)
11. Waste Stream Management (done)
12. Green Cleaning (in development)
*13*. Lighting (done)
14 *Commissioning*

New Guides Under Development

1. Occupant Engagement (done)
2. Measuring + Reporting (done, not yet in KL)
3. *Green Procurement*

New Process Trial: Linked In, Intern, Green Schools Alliance Program, ESUS SME

# Communities of Practice

http://www.ifma.org/community/communities-of-practice

Communities:

1. Operations & Maintenance Health & Safety Community
2. Information Technology Community
3. Business Leadership, Finance, Communication Community
4. Real Estate Advisory and Leadership Community
5. Workplace Evolutionaries (WE) Community
6. Environmental Stewardship Utilities & Sustainability Community

# Upcoming SAG Liaison Calls

- Tuesday, September 27 @ 12 PM CST
- Tuesday, November 22 @ 12 PM CST

**Thank you for joining us today.**

**Questions? Comments?**
**Want to get more involved? Email us at**
**sustainability@ifma.org**

**Contact: Jaclyn Lee**

**Jaclyn.lee@ifma.org**