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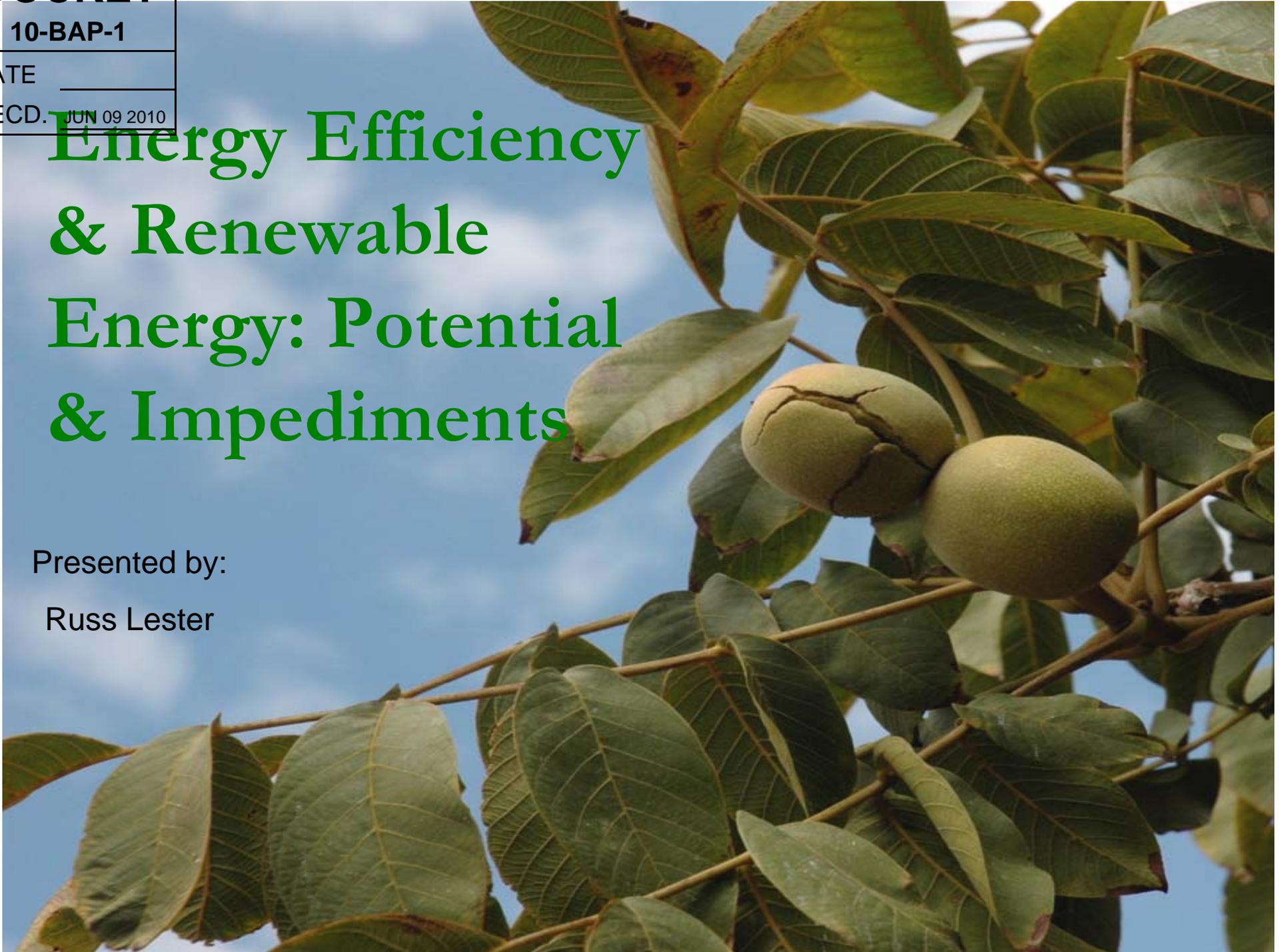
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RECD. JUN 09 2010

Energy Efficiency & Renewable Energy: Potential & Impediments

Presented by:

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Dixon Ridge Farms

- ❑ **Grower and Processor of Organic Walnuts;**
 - Large handler of organic walnuts
 - Large grower of organic walnuts on over 500 acres
 - Buy production from about 2,500 more acres & 67 growers
 - Organic is less than 1% of total US walnut production
- ❑ **Family farming in California since 1867 and organic since 1990;**
- ❑ **We follow a sustainable, whole systems approach to organic farming and business.**



ORGANICALLY GROWN WALNUTS

Our Energy Goal

Total farm and processing net energy self sufficiency by 2012 for all forms of energy

We aim to achieve this goal while taking into account:

1. Carbon neutral or negative
2. Nitrous-oxide neutral or negative
3. Use non-food sources for energy
4. Energy costs should be reasonable
5. Transferable Technology

Some Energy Efficiency Practices

1. Freezers - 2.5 million pound capacity

- Insulation R 80, “normal” is R 25
- Controller improvements
- 40-50% reduction in energy use

2. Dryer Improvements

- Save 35-45% of drying fuel

3. Irrigation – New type

- Overhead hoses & drop sprinklers
- VFD electric pump motors
- Operate at 8-25 PSI vs. 35-60 PSI
- 93% water efficiency & about 25 - 35% pump energy reduction



Since 1883



ORGANICALLY GROWN WALNUTS



Since 1883



ORGANICALLY GROWN WALNUTS





ORGANICALLY GROWN WALNUTS

Current Green Energy Production

1. Solar

- **3,500 square feet of PV panels, 17 kW array**
- **Generates \$3,500/year of electricity**
- **PPA- we pay 80% of retail rate, no capital invested**
- **Very low maintenance**
- **Side benefit – cools building by shading roof**
- **Perfect fit with freezer energy use, peak power use reduction and biomass**



Current Green Energy Production (cont.)

2. **Bio Max 50** – Manufactured by Community Power Corp (CPC), costs about \$400,000; Grant from California Energy Commission (CEC) of \$725,000

- **Production**

- **Hours:** almost 13,000 hrs on generator, 16,000 hrs on gasifier
- **Propane:** Offsets \$12-14,000/year during 5-week drying season
- **Electricity:** Produces up to 50 kW or \$40,000-\$45,000/year
- **CHP:** Use hydronic and hot air to heat our buildings & dryers
- **Local Use:** Will use 100% of produced energy on site
- **Fuel:** Uses about 820,000 pounds of walnut shell per year
- **Great for Base Load Energy, 93% “Up-time”**

- **Environmental Impact**

- **Walnut shells:** Are a renewable, non-food source of energy
- **Carbon Cycle:** CO₂ absorbed by trees to produce walnuts, which are food and shells for energy production. Used to dry and process walnuts.
- **“Waste”:** Non-toxic char-ash is applied to soil; long-term carbon sequestration, fertility amendment and possible N₂O reduction
- **Net negative release of carbon: 1,000 year half-life in soil**





Status Report

□ Energy Generation and Reduction

- 40% reduction of electricity use due to energy efficiency
- 25% reduction of electricity purchased due to generation
- Offset about 20% of our propane use via producer gas
- Reduce dryer heat needs by about 50% via Combined Heat and Power (CHP) and recirculation

→ Total reduction is about 40% of all energy used

→ Already have exceeded AB 32 goals for 2020!



ORGANICALLY GROWN WALNUTS

Future Projects

- Bio Max 100
- More solar panels on the roofs – possibly up to 90,000 sq ft, 450 kW array
- Use CHP in Absorption chillers on HVAC and freezers
- Walnut Oil
- Emissions reduction
- Change gas generator to a “dual fuel” generator
- Research Studies

We will meet our goals!
(Maybe)



ORGANICALLY GROWN WALNUTS

Current Impediments

1. Funding

2. Char/ash Soil Application

3. Emissions

4. Interconnection

-PG&E

-CPUC



Interconnection Impediment

- **Now - Catch 22**
 - **Rule 21/Net Meter- We have had since 2004**
 - Net meter program prohibits biomass & solar on same meter
 - Limited to only 4 renewable energy sources.
 - **RGF Not Fully Develop.** Existing Net Meter rules limit generation to annual on-site use, not resource potential.
 - **Discourages Conservation.** RGF's make "use-it-or-lose-it" decisions.
 - **AB 1969/FIT**
 - **Prohibits interconnection with Projects** that took CSI money, CEC PIER & other grants
 - **Cannot Use Net Meter** – why? Result – it is more costly to IOU and RGF
 - **Don't Know Costs & Requirements** until pay a \$5,000 non-refundable fee
 - **Interconnection Fees** - \$50,000?, more? less?
 - **Interconnection Equipment Requirements** - not consistent, too expensive
 - **FIT MPR** (Market Price Referent) - not high enough & natural gas based

Game stopper for small renewable generators



Current Solution

- **SB 32 and AB 920 improvements are great, BUT**
 - **CPUC needs to fully implement** them and quickly, 1 year??
 - **MPR changes in SB 32** – Are good, but not defined & need to be **fully** implemented in order to be effective
 - **AB 920 allows sales of excess energy** - only after an undefined period, value
 - **Differences between Net Meter and FIT** are less.
 - **Have to re-apply** if go from one to the other
 - **Still discourage early adopters that get incentive \$**
 - **Catch 22 of “mixing renewable electrons” still exists**
 - **Does not solve the problems.**



Solution

- **Rule 21/Net Meter and AB 1969/FIT Programs need to become one.**
 - **Simplify & Eliminate Conflicts** between the two programs.
 - **Accommodate change.** RGFs would not have to decide which program is best for their needs now and in the future, whether RGF imports or exports.
 - **Accommodate DG.** Grid stability and capacity would be increased due to diversity and number of RGFs.
 - **Should Include All Renewables** – As defined by PRC 25741 & PUC 399.11, Decision 03-06-071
 - **Remove or Prorate Fees and Define by RGF capacity**
 - **Use TOD Net-Meter** – 13 mo. True-up simplifies & reduces costs to IOU & RGF
 - **Standardize Interconnection Reqs.** - IEEE Standard # 1547, UL 1741 or the IREC (2007) “Interconnection Standards for Distributed Generation”.
 - **Incentivize Early Adopters** – Allow participation of CSI, PIER Grants, etc.



Solution - Simplified

- **Incorporate all renewables under same incentives program as solar**
 - Not just my idea
 - Meld SB 32 & AB 920 together
 - Use 40 years of solar knowledge to move Bio Mass, Bio Gas, etc. forward
 - Add some improvements needed



Conclusion

- Encourage energy efficiency
- Encourage small, distributed, renewable fueled generation.
- Employ transparent economics to show all costs of energy.
- Renewable fuels information clearinghouse, advocate, etc. is needed
- One stop permitting - emissions, water permits, interconnection, by-products, etc.
- Permitting fees and costs should be scaled to size, impacts
- Need a simplified, fast and consistent method to rectify problems



Final Conclusion

- Diversification of energy types is good, stabilizing the market, power generation and costs.
- **These solutions can be implemented immediately**
- **RENEWABLE ENERGY GOALS CAN BE MET & AGRICULTURE CAN PLAY A LARGE ROLE**