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Title: LANL's Sustainability Program

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LANL'S SUSTAINABILITY PROGRAM

Monica Witt

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

LA-UR-12-20923

LANL Sustainability Challenges

DOE/NNSA Goal
28% Direct and Purchased Electricity (Scope 1 & 2) GHG reduction from 2008 baseline by FY20
13% Indirect (Scope 3) GHG reductions by FY20 from FY08 baseline
26% water intensity reduction by 2020 from FY07 baseline
30% Energy Intensity Reduction by 2015 from FY03 baseline
15 % of existing buildings meet HPSB principles of FY15
Procurements meet sustainability requirements and include sustainable acquisition
Power Utilization Effectiveness (PUE) of 1.4 by FY15

Sustainability Metrics

- Energy Conservation/Intensity (BTU/sf)
  - 9.5% reduction through FY11
  - Footprint reduction efforts counteract reductions in energy usage
- Water Conservation/Intensity (kgals/sf)
  - Water consumption reduced at LANSCE improving site performance
- High Performance Sustainable Buildings: continuing progress
- Data Center Power Utilization Effectiveness
  - Weighted average of datacenters at PUE 1.4
- Direct Greenhouse Gas: Tied to overall site energy usage and purchased electricity
- Indirect Greenhouse Gas: Tied to commuting and purchased electricity

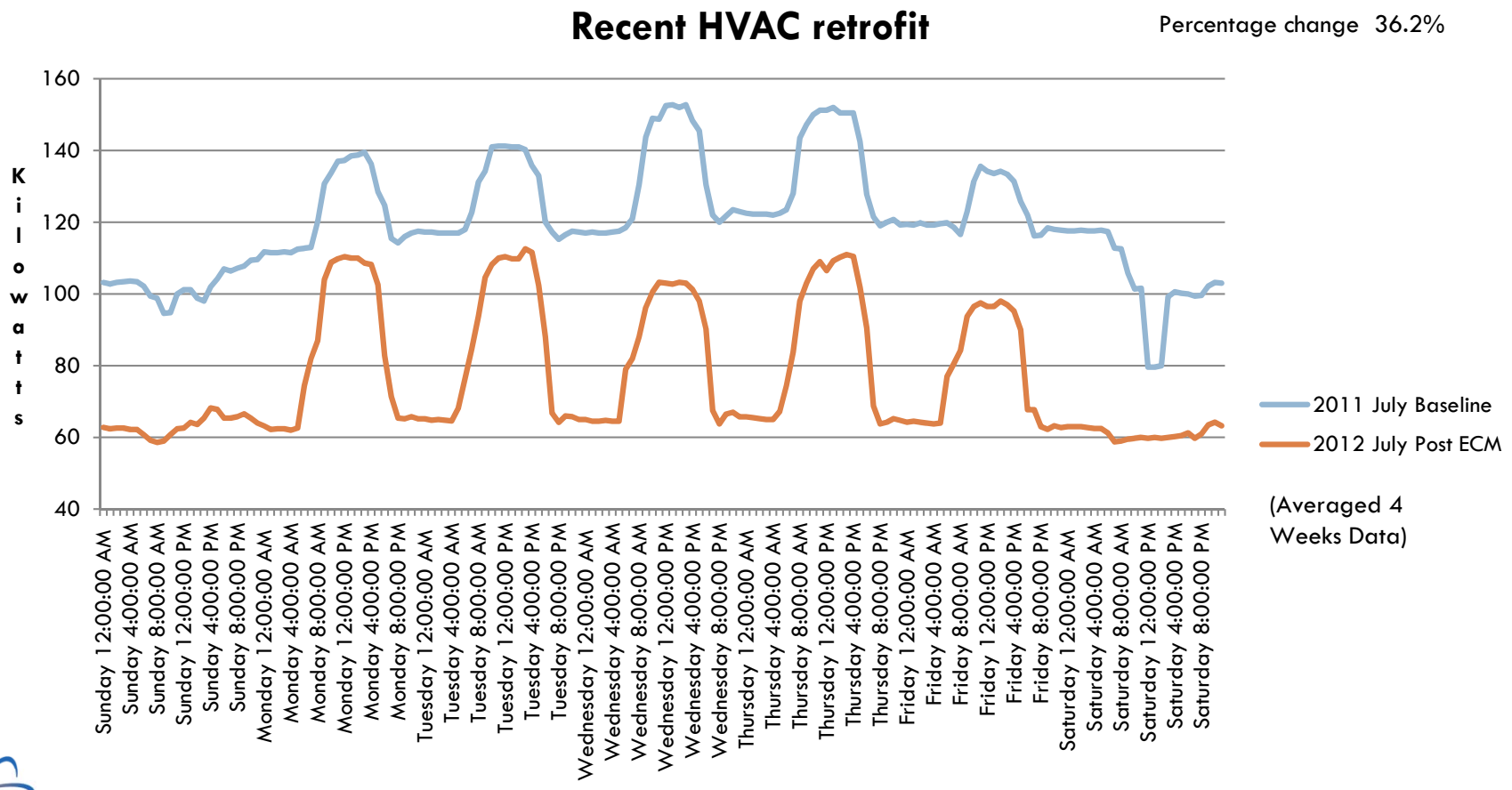
FY12 Sustainability Plan Actions

- Energy Savings Performance Contract
  - Lighting and HVAC retrofits
- HPSB/HVAC Retro-commissioning
  - Improved tenant comfort
  - Identified significant maintenance issues
- Meter installations
  - Increasing meter data and access
- Energy awareness
  - Encourage tenant energy saving efforts through EMS
  - Green Teams
- Data Center Consolidation
  - Optimize institutional data center usage
- Sanitary Effluent Reclamation Facility
  - Begin production operation to reuse sanitary treatment effluent in cooling

Savings in key facilities

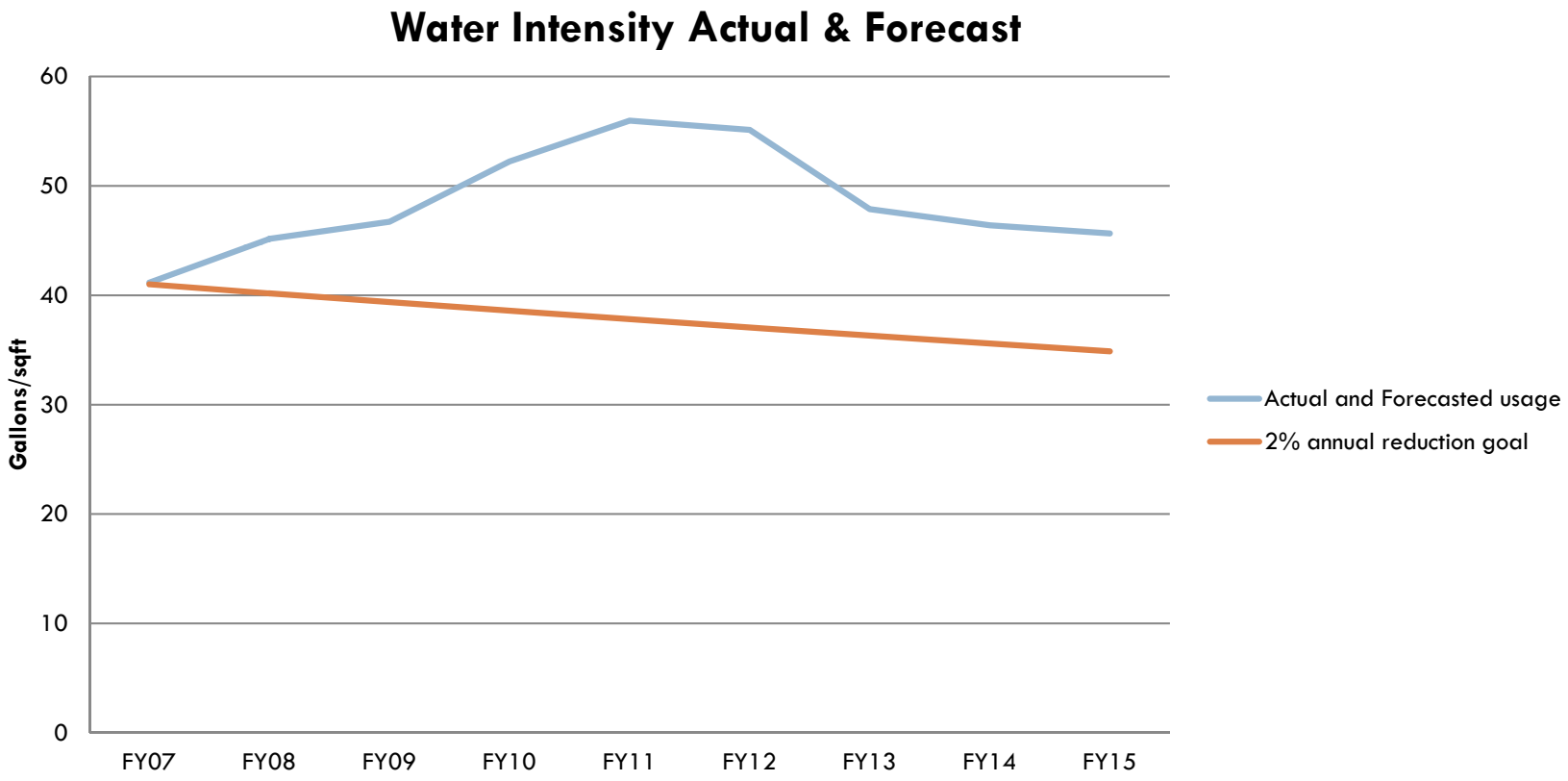
Occ Med Clinic	Electrical savings (kw/month)					
	Mar	Apr	May	Jun	Jul	**Savings**
Pre-ECM	46,595	46,627	54,175	58,240	52,900	**258,537**
Post-ECM	32084	33841	36629	43701	42160	**188,415**
						27.12%

Measurement & verification

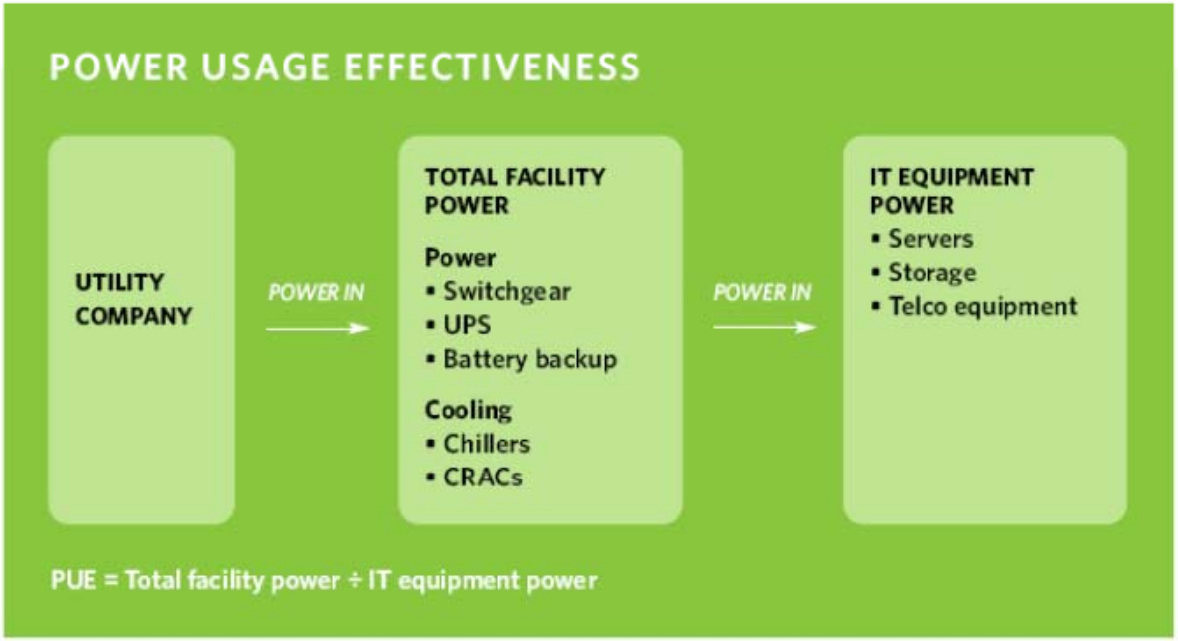


Sanitary Effluent Reclamation Facility

Water intensity reduction

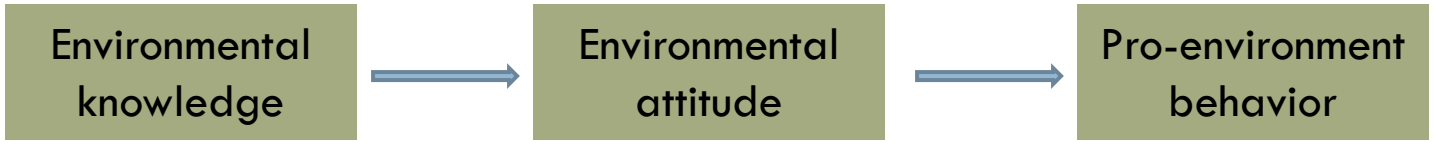


Measuring success in data centers



$$\text{PUE} = \frac{\text{TOTAL FACILITY POWER}}{\text{IT EQUIPMENT POWER}}$$

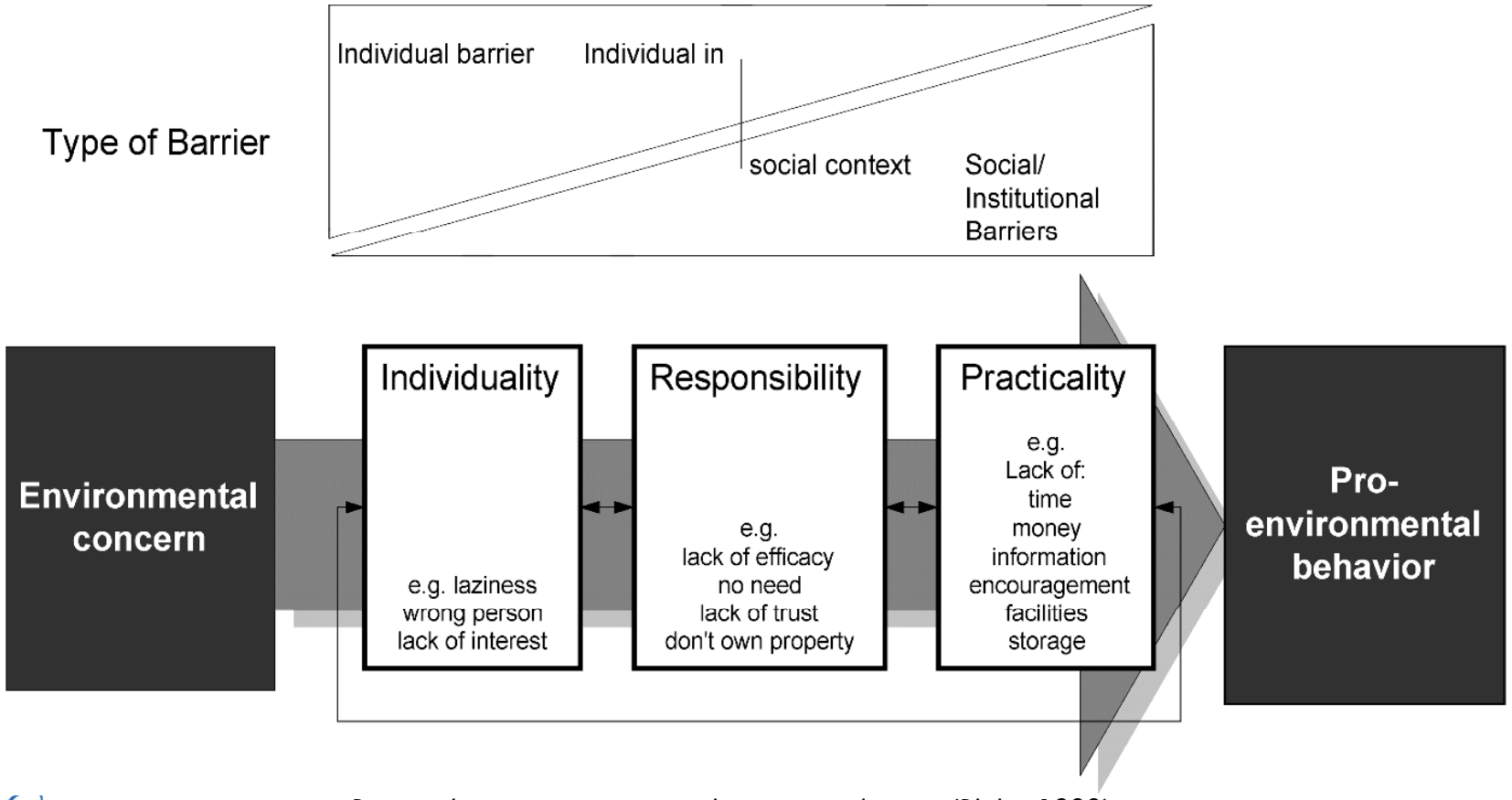
Changing behavior is very difficult



Early models of pro-environmental behavior (1970s)

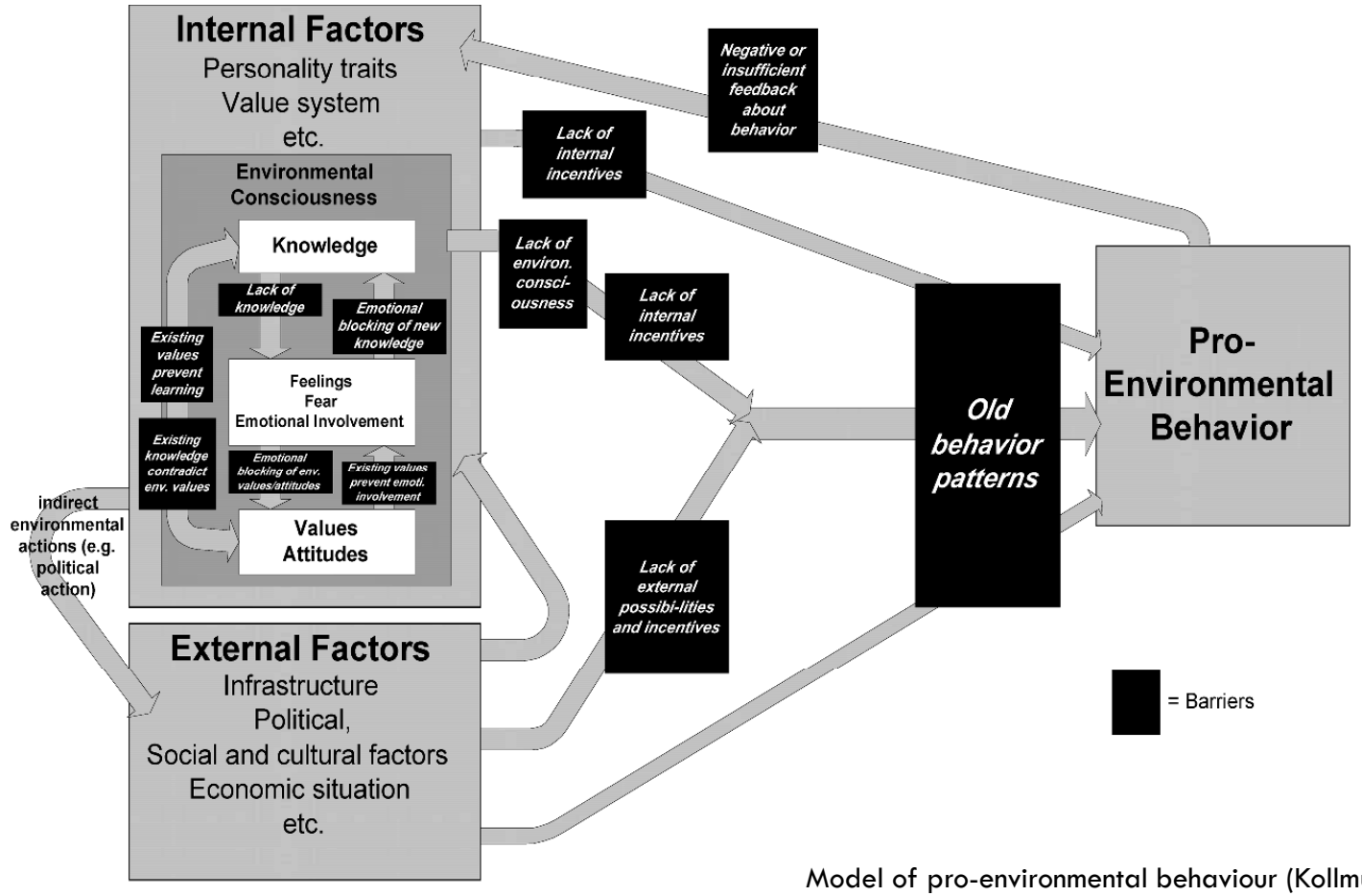
Anyone who has ever tried to change a habit, even in a very minor way, will have discovered how difficult it is, even if the new behavior has distinct advantages over the old one.

Barriers to changing behavior



Barriers between environmental concern and action (Blake, 1999)

New model for pro-environmental behavior



Model of pro-environmental behaviour (Kollmuss & Agyeman)

Final thoughts…

What is the one thing you can do?

if you're cold- wear a sweater, if you're hot-wear a short sleeve, don't leave your environmental concerns at home, turn off your lights, produce less waste, use fewer disposable cups, drive less, stop using to-go containers when you're not taking your food to-go, bring your own coffee mug to work, no more styrofoam, focus on preventative maintenance, re-commission aging facilities, recycle, get rid of all personal printers, turn off the water when you're washing your hair or brushing your teeth, wear your clothes for more than one day to save water, take shorter showers, buy a smaller house, don't leave the water running, donate your clothes, turn off lights, use natural light, turn off appliances and electronics when not in use, unplug the TV when you're asleep or out of the house, don't watch too much TV, use power strips and turn them off when you are out of the house, use a wood stove, turn off computer or your monitor, don't waste food, have candlelight dinners, use reusable water bottles, grow your own food, don't throw away good food, eat food closer to home/eat out less, use cloth grocery bags, plant more trees, choose natural products, use natural light, stop littering., host a clothing swap, play outside and make your own toys, on the road, walk/bike/carpool or take the bus to work/school, drive the speed limit, use both sides of paper, turn down the temperature for your water heater, bring your lunch and use a reusable lunch bag, shop at your local co-op, teach your kids about protecting the environment, support night setbacks in your work facility, focus on life cycle costs instead of upfront costs, change the culture in your office area, get rid of personal refrigerators in your office area, only buy the office supplies you need, study the electrical meter data for your facility, turn down your thermostat in the winter, turn up your thermostat in the summer, enter a facility service request if the temperature in your building is outside of the range 68 – 76 degrees, don't resist change, replace/cut 1 lb. of beef/week from your diet, pay attention to what you put in the trash can, trade in your government vehicle for a smaller vehicle, request a hybrid at work, save gas- don't drive over 55 mph, request less packaging waste, wrap your to-go sandwich in wax paper instead of a to-go box, support renewable energy, expect to see energy efficient products at work and ask why not? when you don't see them, expect less green grass, expect less litter, know your environmental impact- at work and at home, plan projects with waste reduction in mind, shock your students- tell them about our environmental commitment on their first day to work, use less energy than your neighbor, challenge yourself- fill your trash can less each week, conduct management walk-arounds with the environment in mind, raise chickens,

Youngest optimist…

Resources

- *Mind the Gap: why do people act environmentally and what are the barriers to pro-environmental behavior?* **ANJA KOLLMUSS & JULIAN AGYEMAN *Tufts University, Medford, MA.*** *Environmental Education Research, Vol. 8, No. 3, 2002*
- **BLAKE, J.** (1999) Overcoming the 'value–action gap' in environmental policy: tensions between national policy and local experience, *Local Environment, 4(3), pp. 257–278.*
- **REDCLIFT, M. & BENTON, T.** (1994) Introduction, in: M. REDCLIFT & T. BENTON (Eds) *Social Theory and the Global Environment (London, Routledge)*