U.S. Department of Energy
Energy Efficiency and Renewable Energy

IAC Student Meeting
Field Management Review

Don Kasten
Manager of Technical Operations
February, 2008
Washington, DC

CAES
CENTER FOR ADVANCED ENERGY SYSTEMS

Rutgers The State University of New Jersey

AS IAC goes into its 32nd year…

What Do We Do?

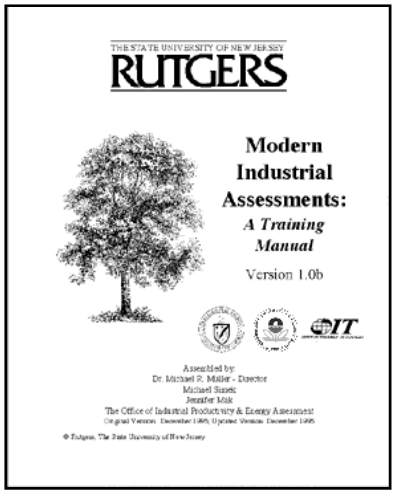
- Manage
  - Technical support
    - Database

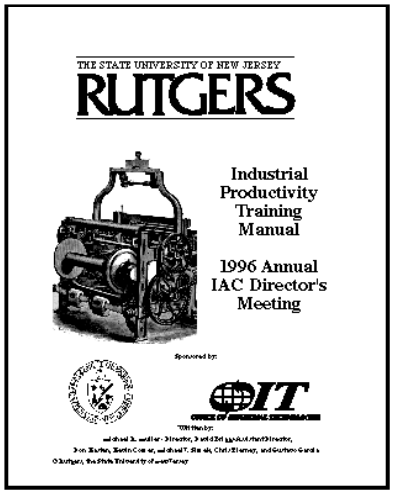
Manage

- Make sure the work gets done each year (boring!)
  - Not uncommon in fed programs not to be on time
  - *We have a great on time record!*
- Provide education about the program to the public
  - SEN Webcast
- Act as interpreter
  - Top down - Focus of DoE – **MEP!**
  - Bottom up - Voice of your concerns to DC

Technical Support

- Training – IAC , Manuals, Webcast
- Directors meeting
- Review of reports (Critiques)
- Research new technologies
- Advise new programs, BP tools

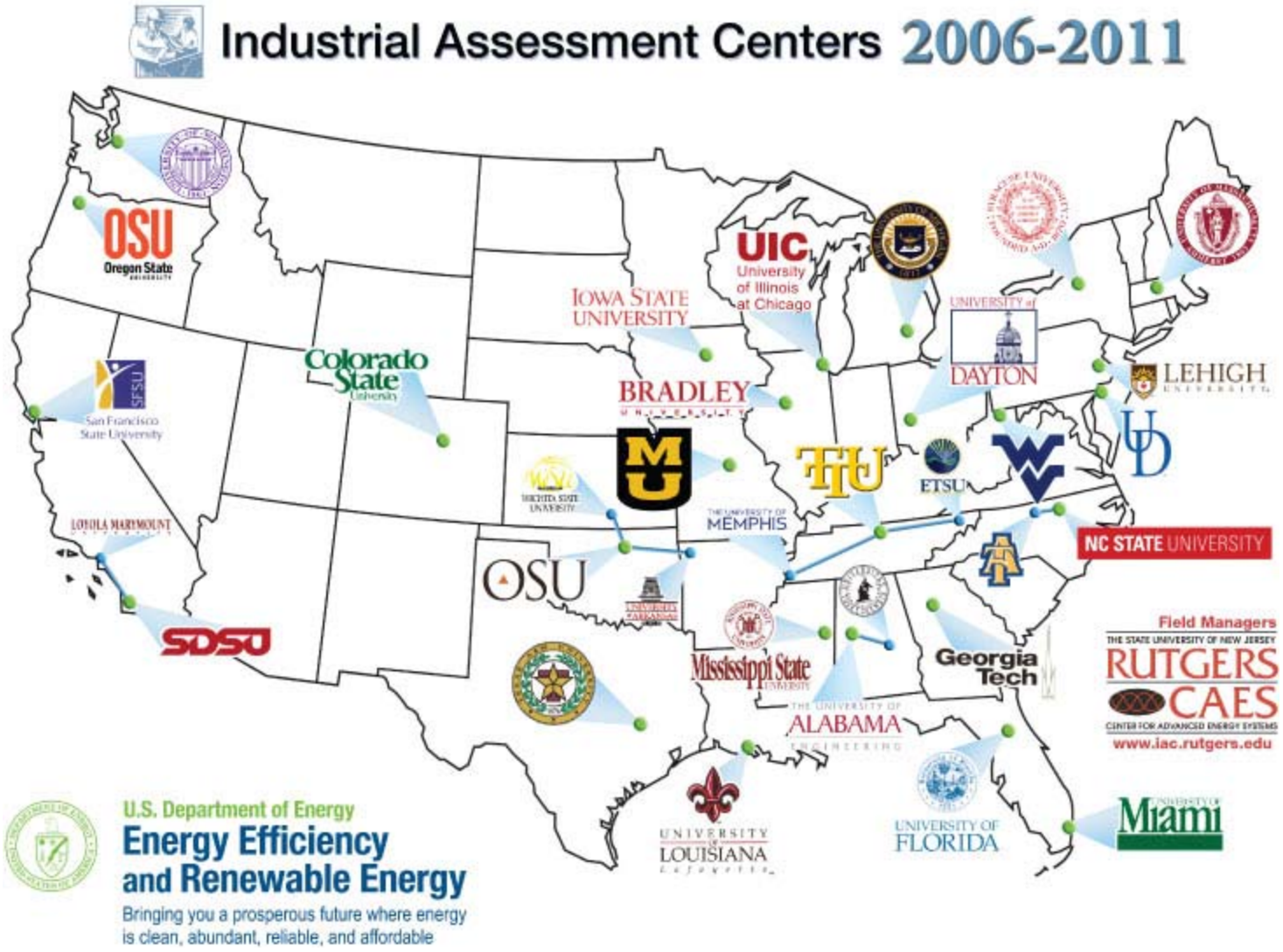


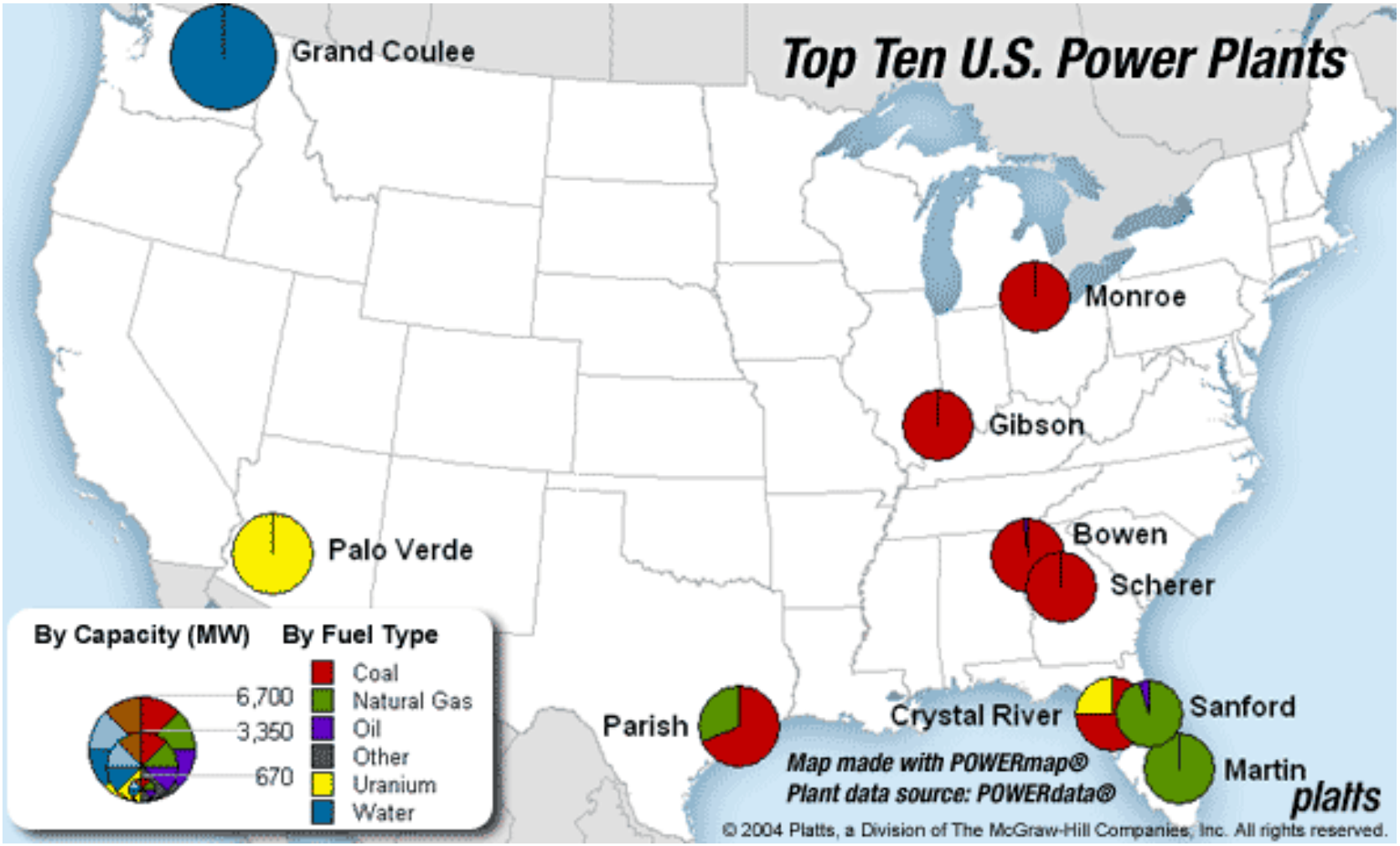


Database – don't touch that dial!

- Mike will tell you more than you want to know

What do you do?




Top Ten U.S. Power Plants
Grand Coulee
Monroe
Gibson
Palo Verde
Bowen
Scherer
Parish
Crystal River
Sanford
Martin
By Capacity (MW)
By Fuel Type
6,700
3,350
670
Coal
Natural Gas
Oil
Other
Uranium
Water
Map made with POWERmap®
Plant data source: POWERdata®
platts
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IACs Produce Power

- a source or means of supplying energy

We Produce Nega-watts

Definition of Power:

- ability to act or produce an effect

We Produce Energy Engineers

How?

One day assessments – With Numbers!

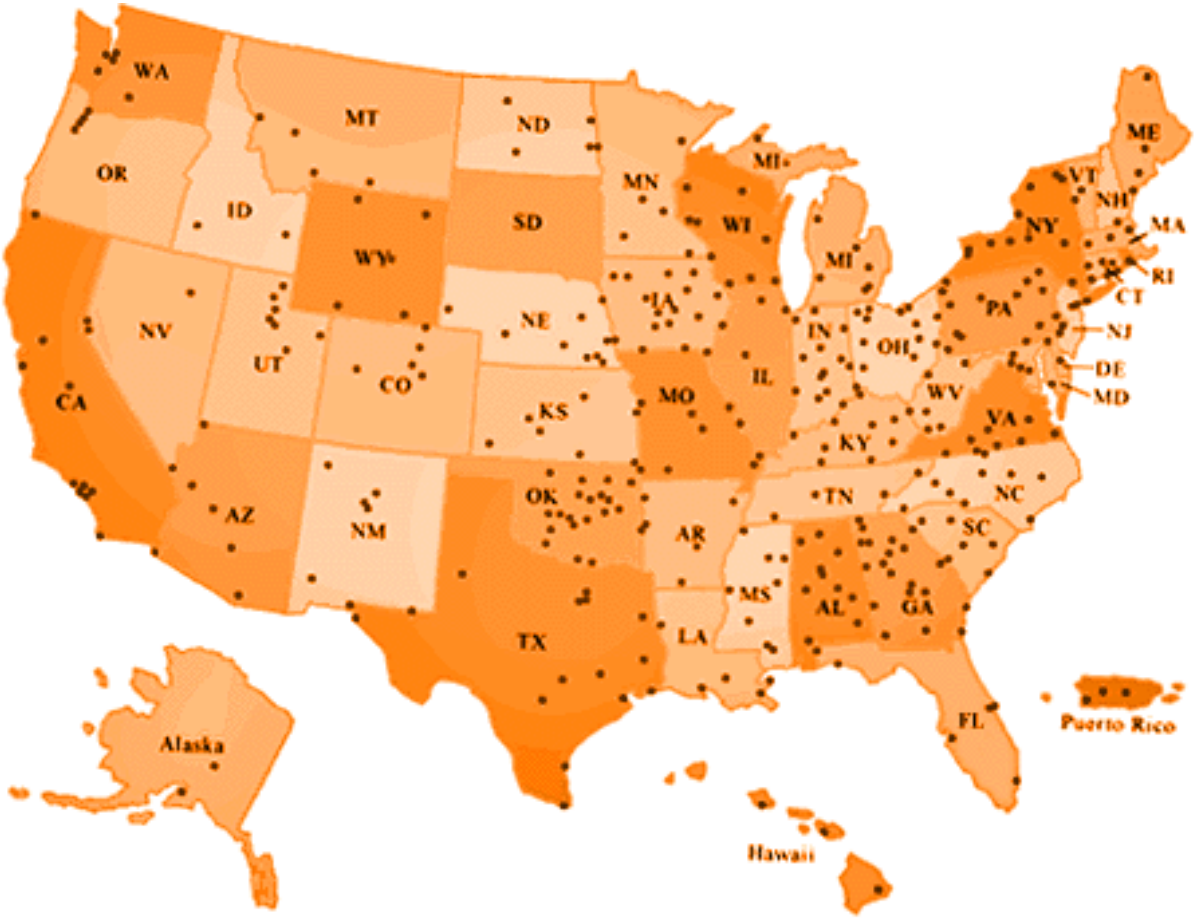
This is a dramatic concept

- The IAC model of assessment
- The IAC style report

Is becoming recognized in the field

2007 Projects

Manufacturing Extension Partnership



MEP Project – More Successful than Hoped for

What is it?

- Organization operated by Dept. of Commerce
- What are we trying to do?
  - MOU between departments for cooperation
- Why are we doing it?
  - For IAC – reach more clients
  - For MEPs – reach motivated clients

Adopt-A-Technology

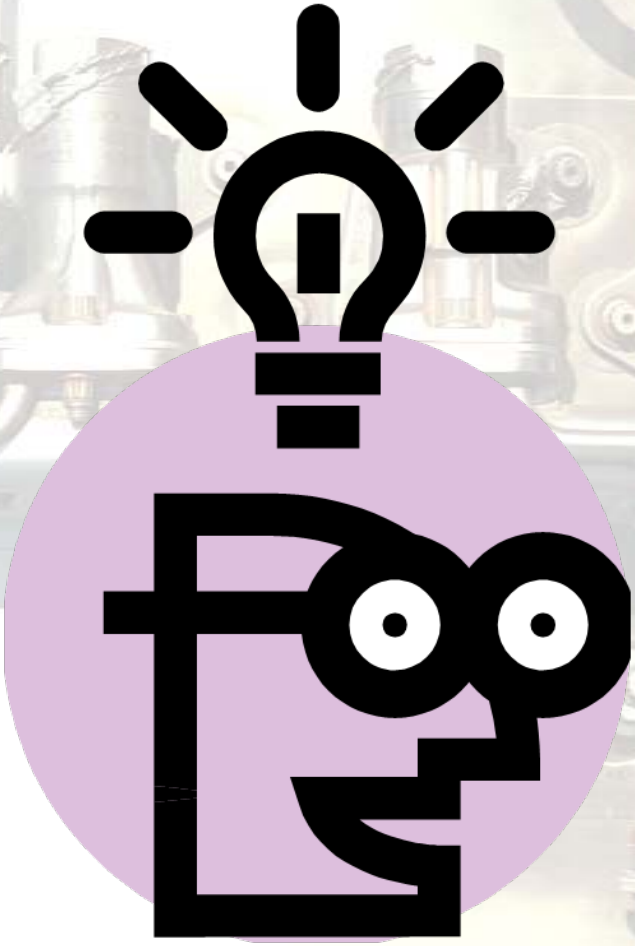
- Every Center has adopted a technology that was jointed developed by a vendor and the ITP
- Technologies are Identified at

http://iac.rutgers.edu/database/adopt_tech.php

Adopt-A-Technology

Housekeeping

What We would like to see



- Good Ideas
- Consistency

Housekeeping note:

- ARC list is categorized by “type”
- 3.xxxx for energy
- 3.xxxx for waste
- 4.xxxx for productivity

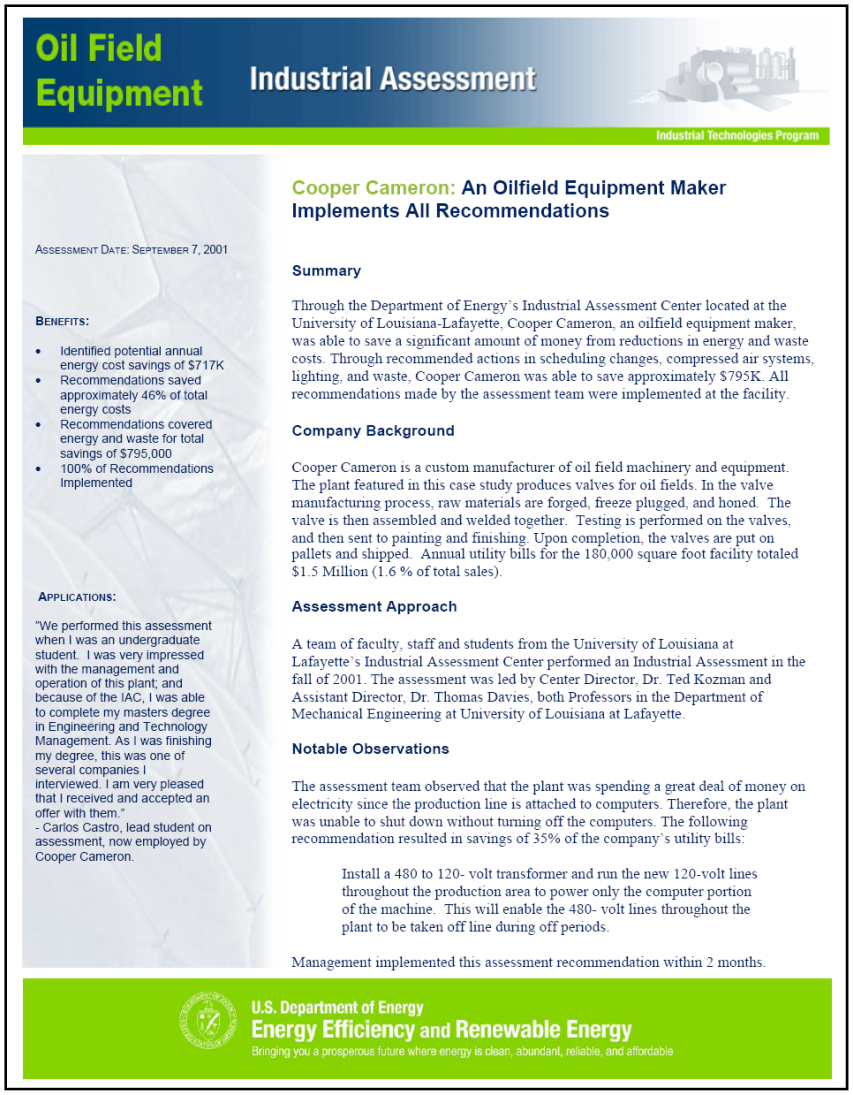
- Users of database sort by this
- Even if description in another section is better.

Housekeeping

What We don't Need to See

- Misplaced Precision
  - Recipes that call for exact amounts, then a "pinch"
  - Too many significant figures
  - ***The 2,000,007 year old dinosaur***

Case Studies



Oil Field Equipment Industrial Assessment

Industrial Technologies Program

Cooper Cameron: An Oilfield Equipment Maker Implements All Recommendations

ASSESSMENT DATE: SEPTEMBER 7, 2001

BENEFITS:

- Identified potential annual energy cost savings of $717K
- Recommendations saved approximately 46% of total energy costs
- Recommendations covered energy and waste for total savings of $795,000
- 100% of Recommendations Implemented

APPLICATIONS:

"We performed this assessment when I was an undergraduate student. I was very impressed with the management and operation of this plant; and because of the IAC, I was able to complete my masters degree in Engineering and Technology Management. As I was finishing my degree, this was one of several companies I interviewed. I am very pleased that I received and accepted an offer with them."
- Carlos Castro, lead student on assessment, now employed by Cooper Cameron.

Summary

Through the Department of Energy's Industrial Assessment Center located at the University of Louisiana-Lafayette, Cooper Cameron, an oilfield equipment maker, was able to save a significant amount of money from reductions in energy and waste costs. Through recommended actions in scheduling changes, compressed air systems, lighting, and waste, Cooper Cameron was able to save approximately $795K. All recommendations made by the assessment team were implemented at the facility.

Company Background

Cooper Cameron is a custom manufacturer of oil field machinery and equipment. The plant featured in this case study produces valves for oil fields. In the valve manufacturing process, raw materials are forged, freeze plugged, and honed. The valve is then assembled and welded together. Testing is performed on the valves, and then sent to painting and finishing. Upon completion, the valves are put on pallets and shipped. Annual utility bills for the 180,000 square foot facility totaled $1.5 Million (1.6 % of total sales).

Assessment Approach

A team of faculty, staff and students from the University of Louisiana at Lafayette's Industrial Assessment Center performed an Industrial Assessment in the fall of 2001. The assessment was led by Center Director, Dr. Ted Kozman and Assistant Director, Dr. Thomas Davies, both Professors in the Department of Mechanical Engineering at University of Louisiana at Lafayette.

Notable Observations

The assessment team observed that the plant was spending a great deal of money on electricity since the production line is attached to computers. Therefore, the plant was unable to shut down without turning off the computers. The following recommendation resulted in savings of 35% of the company's utility bills:

> Install a 480 to 120- volt transformer and run the new 120-volt lines throughout the production area to power only the computer portion of the machine. This will enable the 480- volt lines throughout the plant to be taken off line during off periods.

Management implemented this assessment recommendation within 2 months.

U.S. Department of Energy
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Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

- **2006 Case Studies Due**
- **Must have results**
- **Must have permission**
- **Only Have 6 so Far!**

Energy Intensity (P3) ARs

Energy Intensity Improvement (P3) Guideline
October 2006

P3 is a new production resource code that was added to the list of resource identification codes. The P3 code was not intended to replace any of the other production resource codes. Its intention was to segregate non-energy production increases with energy production increases. By doing this, the database will automatically calculate the effective energy savings due to production increases. Effective energy savings are savings due to a decrease in energy intensity by optimizing the plants production. Thus, recommendations where the additional energy to create a new unit of production will be less by the recommendation than by the plants current methods are encouraged. If the energy intensity increases, this will have an increased negative effect on your metrics. An example is also available at the end of the guideline.

Instructions on Using the New Resource Code

1. Use the P3 code when a productivity recommendation has an effect on the plants energy consumption. This includes increases as well as decreases in energy consumption.
2. Include the P3 code in the p*rimary resource code* column.
3. The *primary resource savings* for P3 codes will be in percentages of increasing production. For example, a 100 piece per year increase in a plant that produces 1000 pieces/year will yield a 10% increase in production.
4. The *primary resource savings* will be represented by a whole number. In the previous example, 10% will be written as 10 in the primary resource savings.
5. In the *secondary, tertiary and quaternary resource columns*, include the energy savings or increases. Make sure increases are denoted as a negative.
6. The primary cost savings shall remain the same as savings resulting from production increases.

Example

A recommendation to increase the plants production by 10% will yield additional sales of $65,000/year. The plant will consume an additional 50,000 kWh/year at an increased cost of $4,500/year. Below is how the upload form should correctly be filled out.

			Primary	Primary	Primary	Secondary	Secondary	Secondary	Tertiary	Tertiary	Tertiary
AR #	AR Description	ARC	Resource Code	Resource Saved	Cost Savings	Resource Code	Resource Saved	Cost Savings	Resource Code	Resource Saved	Cost Savings
1	Increase Plants Production	4.xxxx	P3	10	65000	EC	-50000	-4500			

- Your homework for 2008
- Produce at least one P3

Energy Intensity (P3) AR

Differs from Energy AR in that the Energy use goes up.

- ARC Code 4.xxxx
- Primary Resource Code P3
- Primary Resource Saved, shown as a percent
- Energy Resources are shown as positive “effective” energy savings

- How is this done?

Energy Intensity (P3) AR

1) The original energy intensity is calculated
2) Original plus new Energy Use and Cost are divided by new Production
3) New energy intensity and cost are calculated for the first 100% of production
4) The difference between the two is called “effective” energy savings

Obviously this does work unless the profit goes up.

Energy Intensity (P3) AR

This is not a new idea.
But we will post a document on the internal page with examples.

On Accounting for Energy Savings from Industrial Productivity Improvements

Kyriaki Papadaratsakis, Donald J. Kasten, Michael R. Muller
Rutgers University, Center for Advanced Energy Systems

What Does This Have to Do With Me?

- Student Utilization
- Student Experience

Student Utilization

- How many students in each center
- what does a typical student life look like?
  - How many assessments do you do on
  - How long does a student stay with a center
  - What is the mix of students
- Pay! (should be more than the dining hall)

Student Experience

- Opportunity, not a job
- Attend meetings, write papers
- Looking for diverse experience – not specialization
- Lead student
- Report lead, safety lead
- Our visit to center is crucial

Student Experience

- Certification
- Talk the Talk
- Make Connections!
- It’s not all about payback

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