

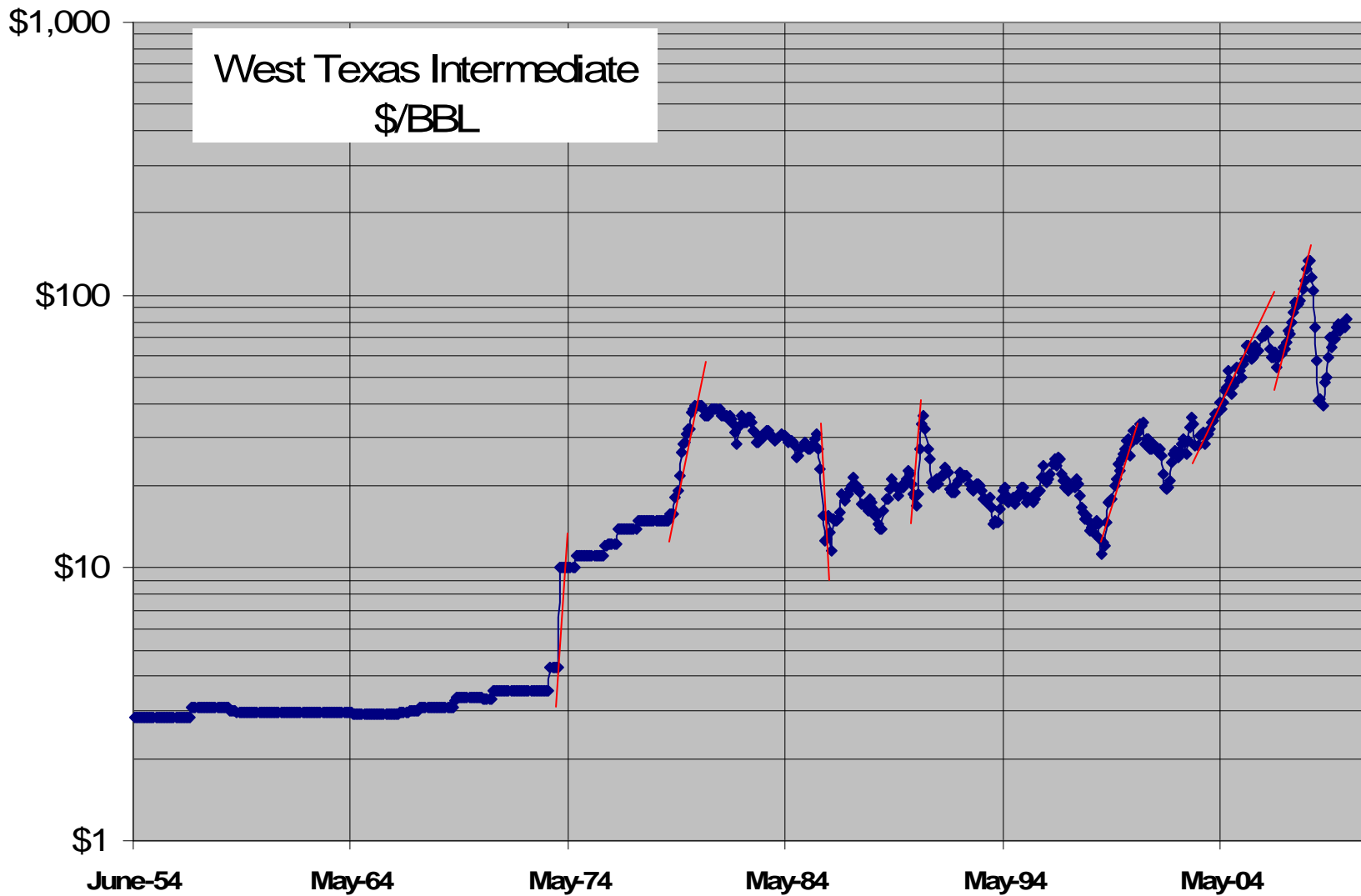
# Sub-Metering: Energy Savings Measurement and Verification

*by Richard Russell, PE*





# Barometer of Interest in Saving Energy



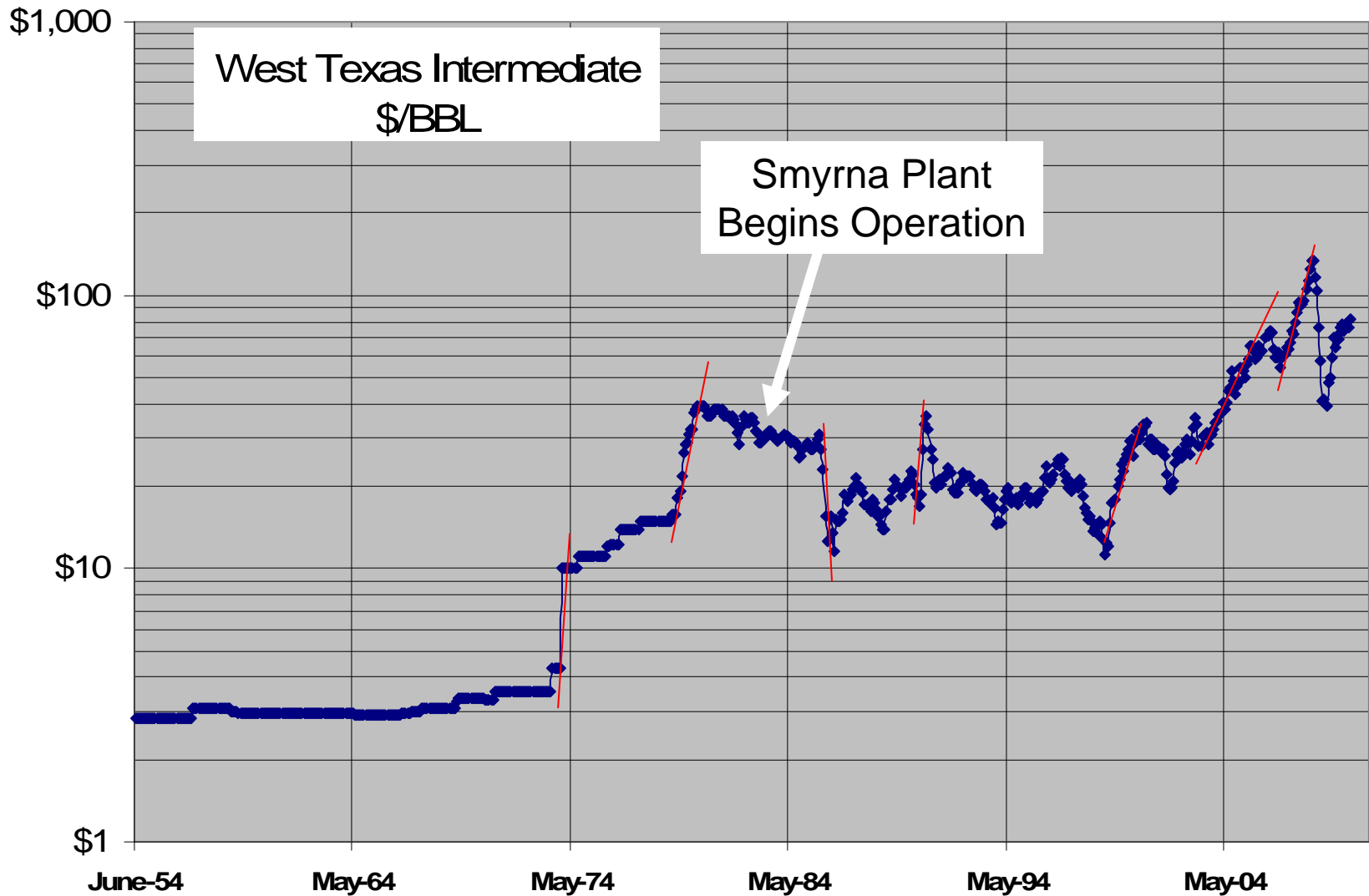


# Barometer of Interest in Saving Energy





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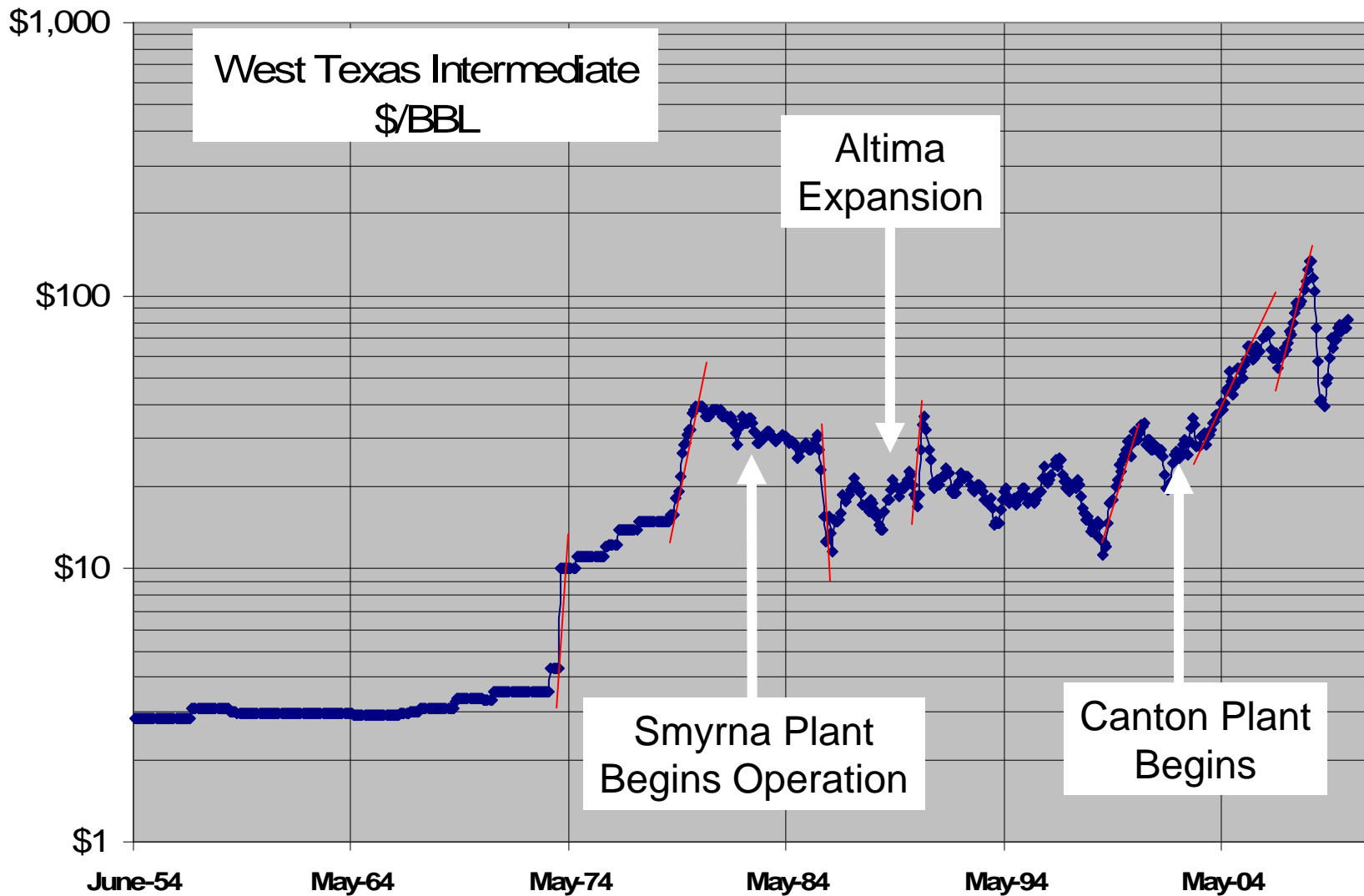


# Barometer of Interest in Saving Energy

**Based Upon A True Story**



# Barometer of Interest in Saving Energy



# Energy Management Team

Manufacturing

Communications

Engineering

Finance

Maintenance

Legal

Purchasing

Suppliers

Environmental



"The power  
comes from inside"

# What drives our measurement program?

An earnest desire to:

- eliminate waste
- reduce cost
- reduce burden on environment

- *in the manufacture of our products*



# What do we measure?

- Energy Use
- Production Volumes
- Hours of Operation
- Weather Data
  - including outside air enthalpy

# Who is accountable?

- Each Energy Management team member for supporting the team
- Each shop for making their budget
- Each plant director and VP for making their business plan target

# How Results are Reported?

## The Data:

- Transparent – Open To All
- Zen (no flash & dazzle) Clear Communication; Intuitive Visual Design
- Easy to Slice and Dice for Special Purposes

# How Results are Reported?

## Prepared Summaries:

- Monthly Budget Report - Just The Facts with Support
- Monthly One High Level Budget Year To Date and Forecast Year End

What we ~~have learned~~ are learning:

# Start At The Top!

- Get Support From Senior Management

What we ~~have learned~~ are learning:

Be Bold!

Big Targets, Open The Mind  
to New Ways Of Thinking

What we ~~have learned~~ are learning:

Build A Cross Functional Team  
with Diverse Representation

What we ~~have learned~~ are learning:

## Participate In Benchmarking with Your Competitors

- Best Practices
- Agreed Metric



What we ~~have learned~~ are learning:

Measure what  
is *Important!*

What we ~~have learned~~ are learning:

## Liberate Data:

- Make It Easy To See What Is Happening
- Rapid Positive Feedback

What we ~~have learned~~ are learning:

Know Your Savings  
and Make It Relevant

## Today's Takeaway

If You Can Takeaway  
One Thing Today,

*It is not one thing!*