

Induced Austerity in CO₂ EOR: A Look to Crashes of the Past¹, What is Happening Today² and What May Come in the Future³

CO₂ Flooding Conference; December 11, 2015

¹ L. Stephen Melzer, Melzer Consulting

² Gary Bullock, Whiting Petroleum

³ Charles Fox, Windy Cove

Midland Center
Midland, Texas

A Look to Oil Price Crashes of the Past

In the world of oil prices:
“It is déjà vu all over
again” *

- * Quote attributed to an American sports icon,
Yogi Berra (*we'll miss you*)

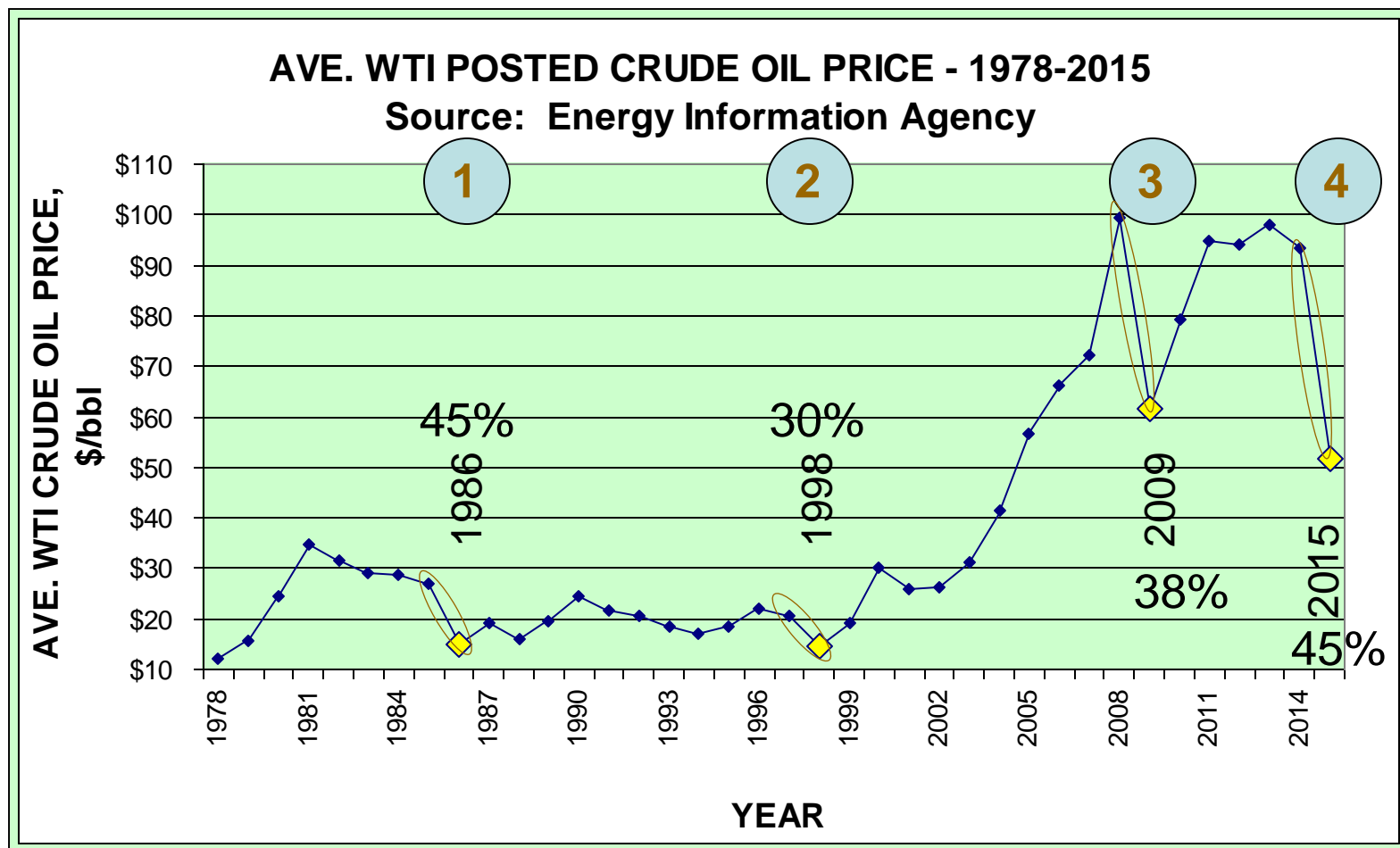


The Range of Impacts of Oil Price Crashes on CO₂ EOR

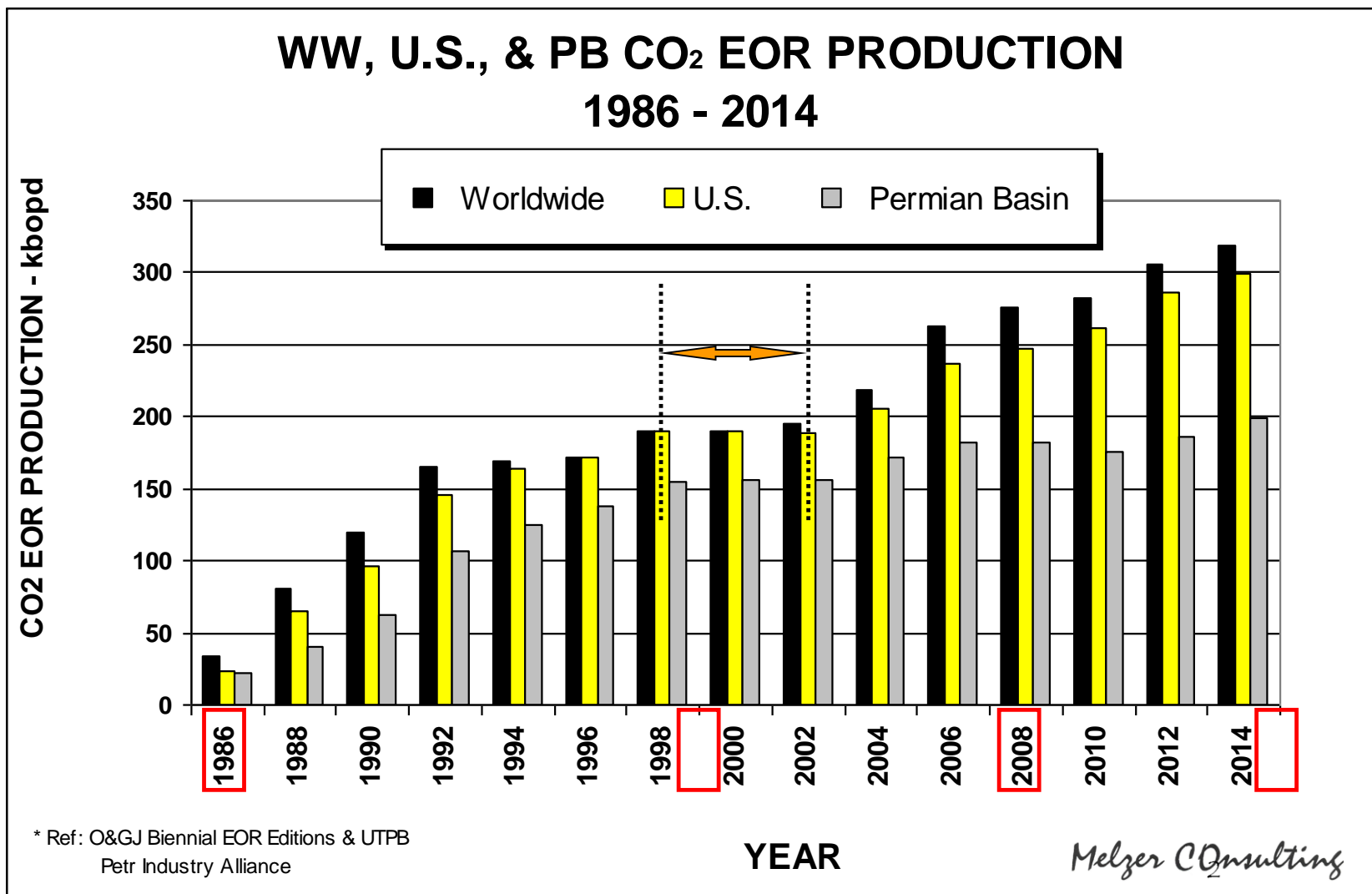
What History Tells us About Oil Price Crashes on
CO₂ EOR Activity

Impacts on Oil Production, Flood Starts, CO₂ Sales,
Flood Longevity, Innovation, etc.

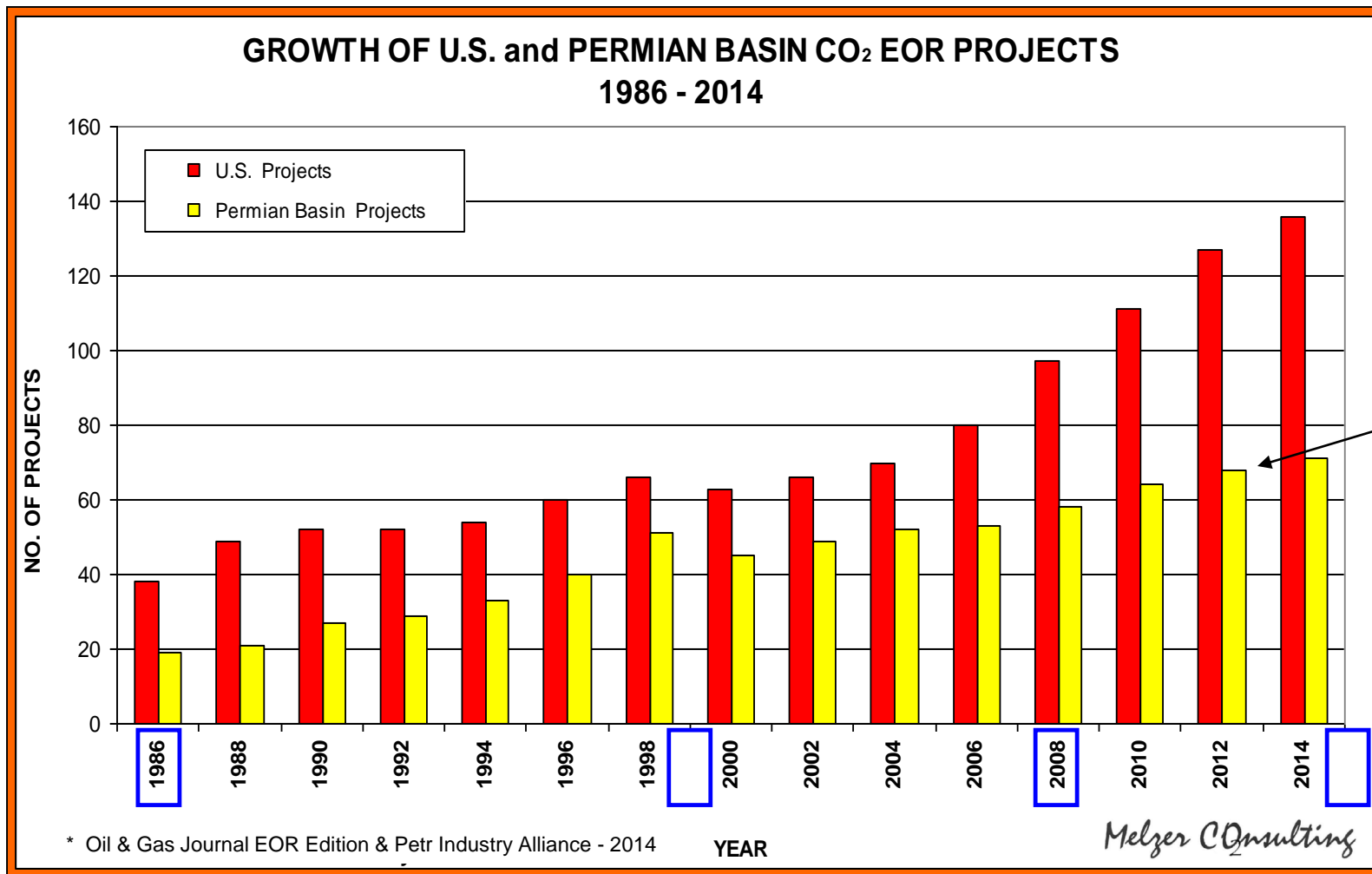
West Texas Intermediate Oil Price vs. Year and Oil Price Crashes Over the Last Four Decades



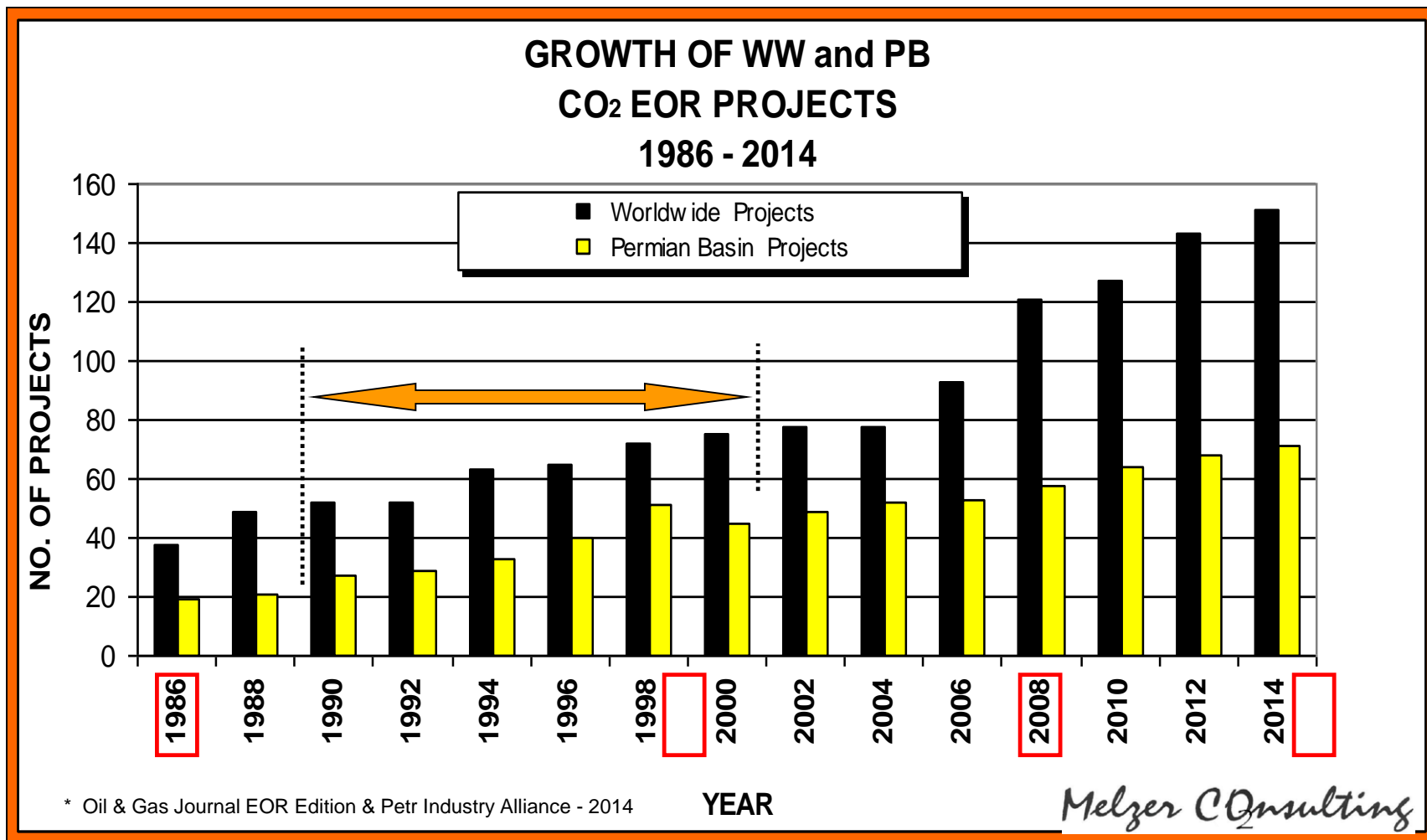
CO₂ EOR and its Steady Growth (Production)



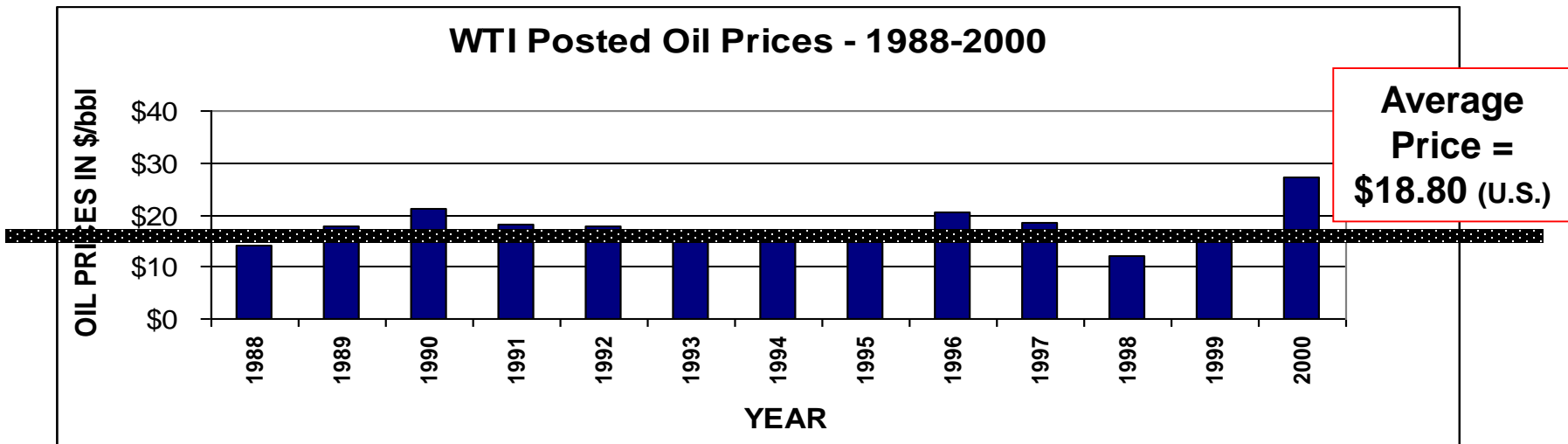
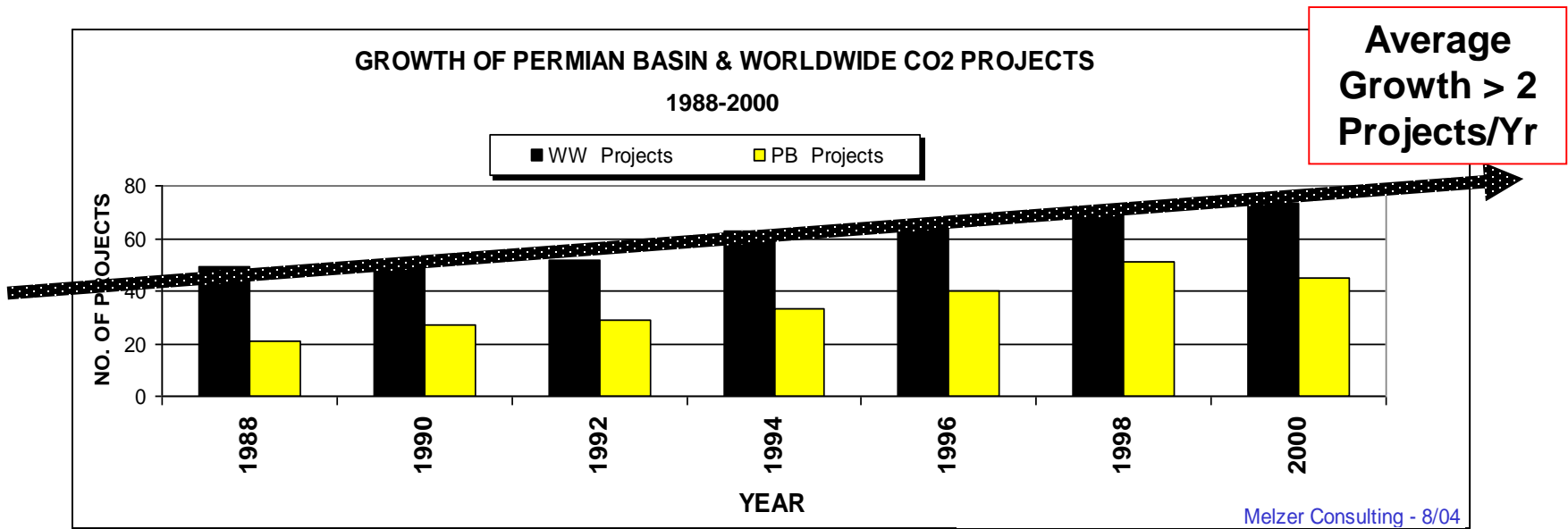
History of CO₂ EOR Project Growth*



Worldwide and PB Project Growth*)



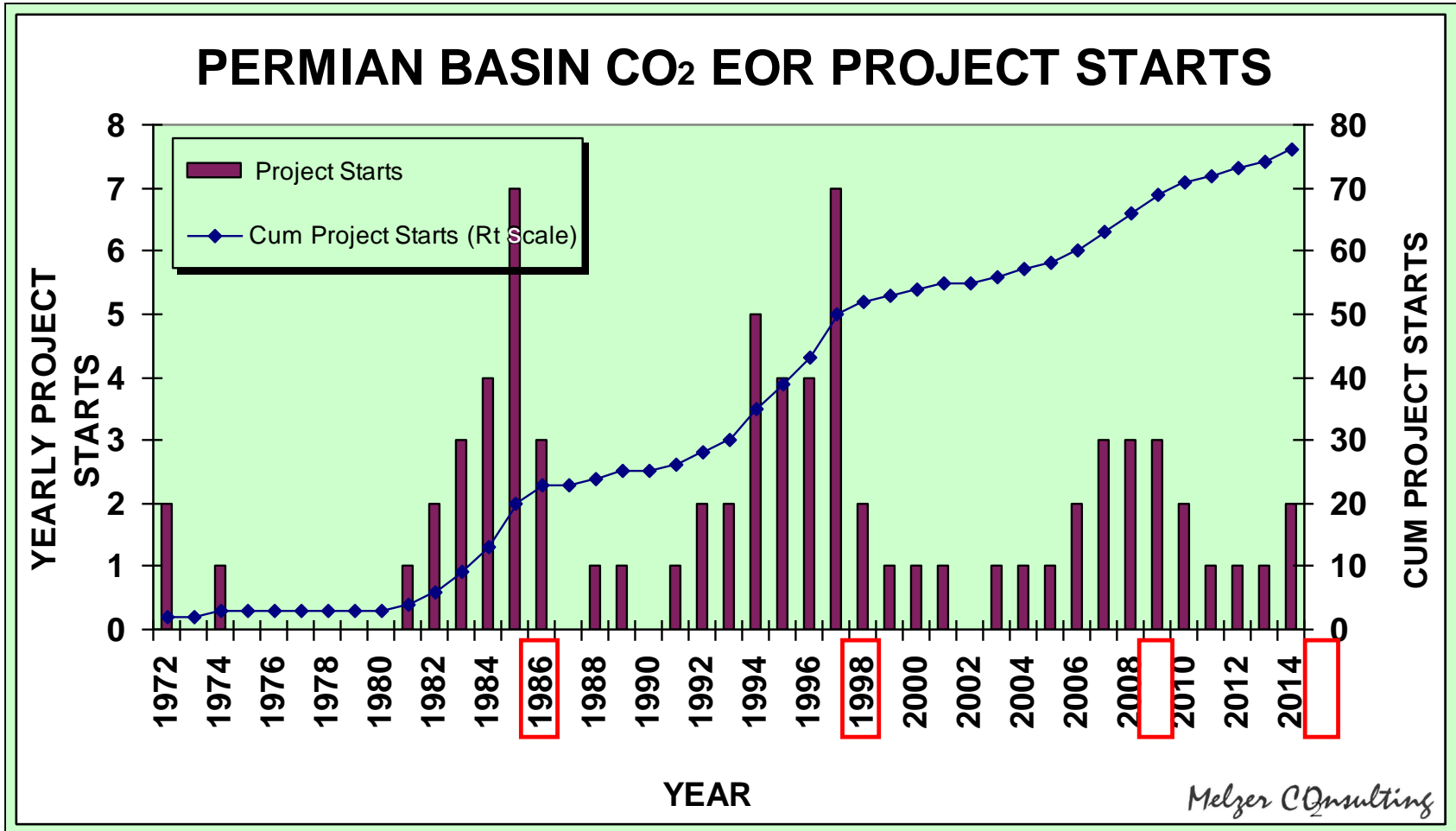
.....and Growth Even with Languishing Oil Pricing



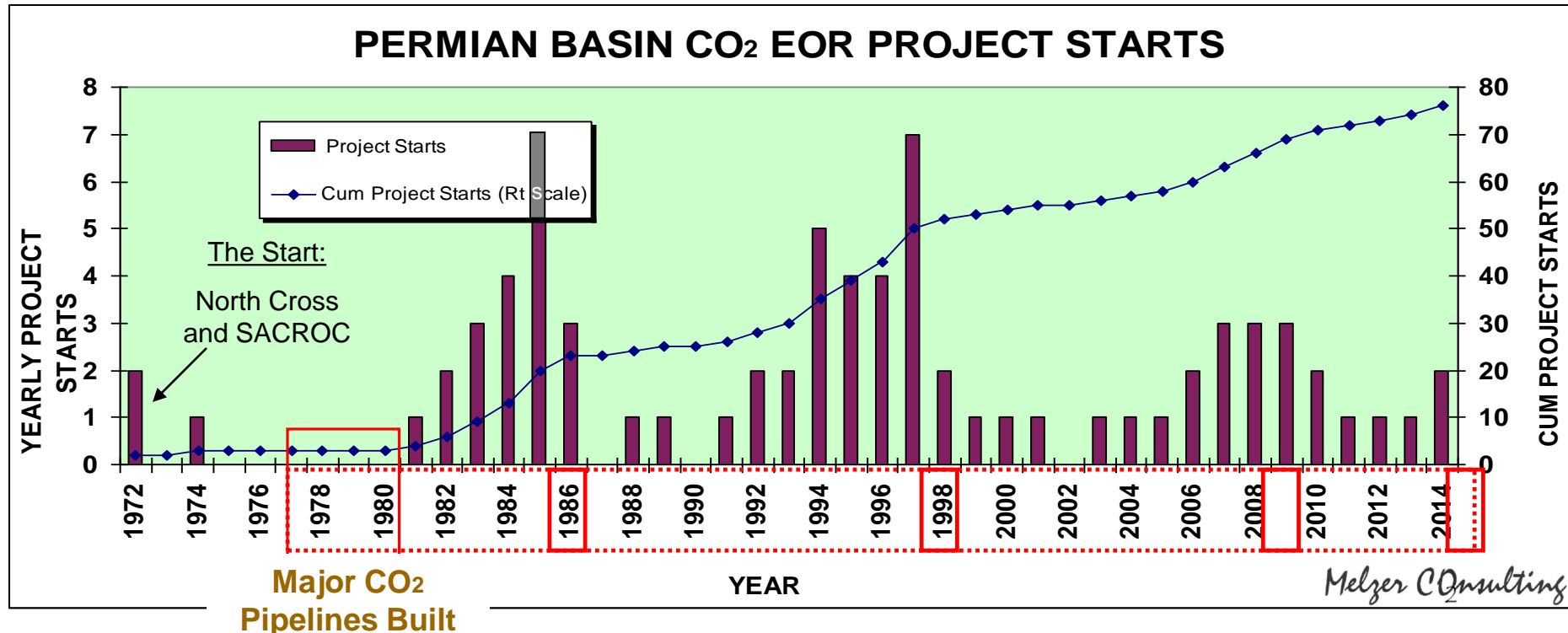
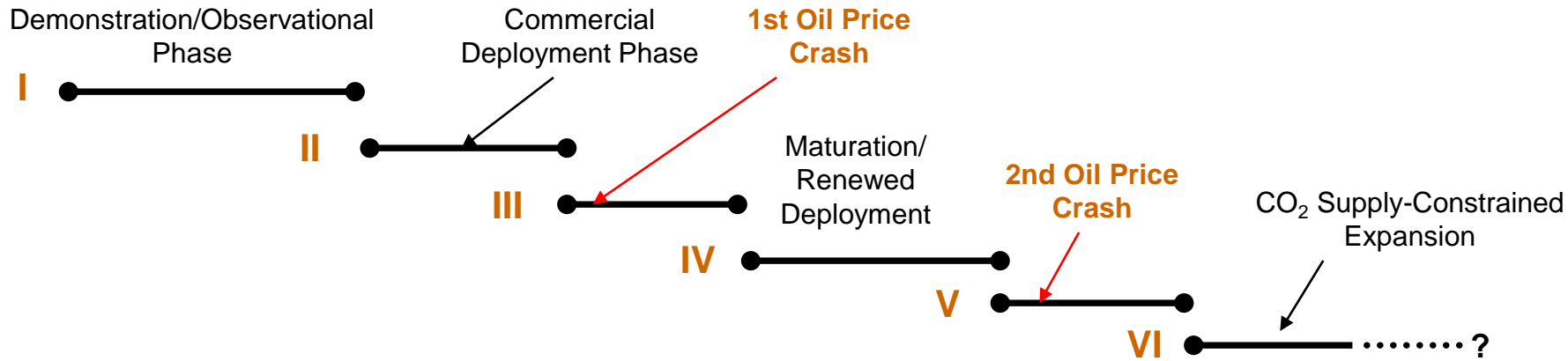
Conclusion: CO₂ EOR Technology had Matured

Oil Prices Do Affect CO₂ Flood Starts

The History of Newly Implemented Floods (PB)



THE PHASES OF CO₂ ENHANCED OIL RECOVERY*



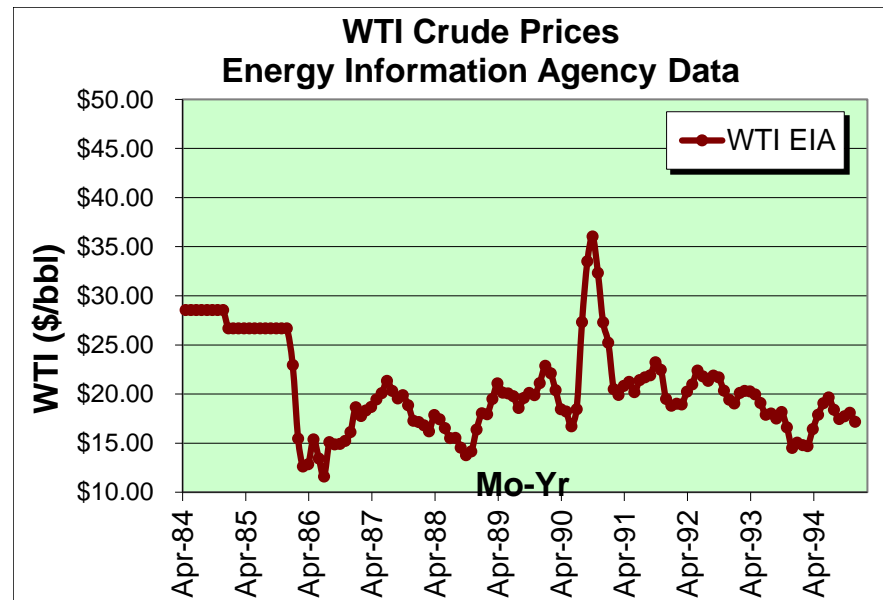
* as "Benchmarked" to the Permian Basin Region of the SW U.S.

A “New Day” This Time Around?

First, About Oil Supply in General, *What is the Same?*

- Oversupply of Oil When Compared to Demand
- Drop in Oil Price is Dramatic (about 45-50%)
~ Same as 1986 Crash

We Might Look at the 1986 Crash as the Best Analogue?



But...What is Different?

Oil Supply and Oil Demand

- Excess WW Production Capacity Today is Very Limited (~2 Million bbls/day)
 - In 1986, Just before Crash, it was in excess of 9 Million bbls/day
- Much of the Incremental Oil Creating the Surplus in Supply Will Decline Rapidly
- Maybe Early to Tell Yet but Demand Elasticity (to Oil Price) was Greater in the Past

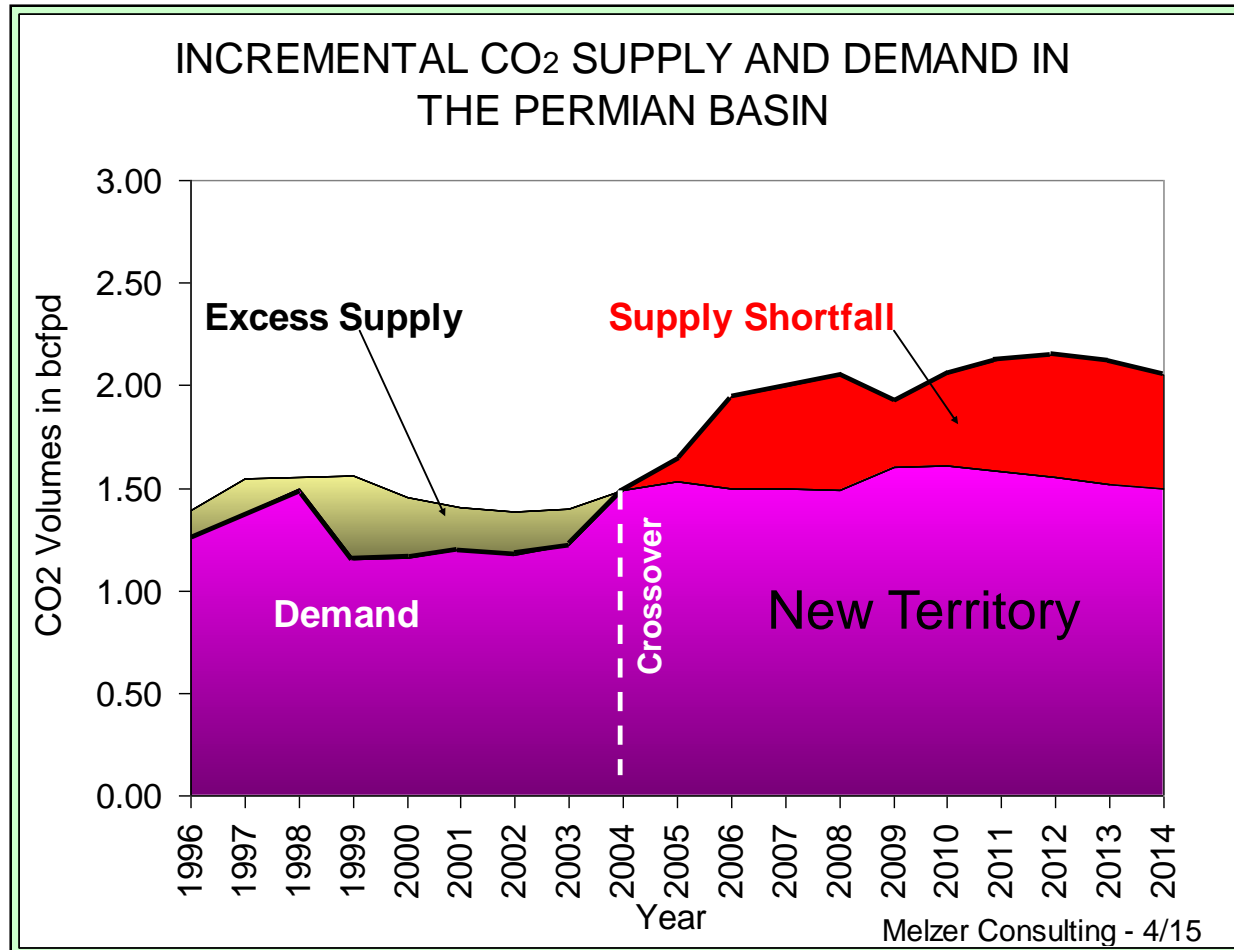
What is Different?

CO₂ EOR in Particular

- The World Places a Higher Value on Clean Energy than in the Past
- Can CO₂ EOR Play a Role in the Clean Energy Transformation?
- We Entered the Current Oil Price Bust Short of CO₂ for EOR

What is Different?

CO₂ Supply and Demand in the PB



“Chaos often breeds life, when
order breeds habit”

Henry Adams

*We should be breeding a lot of
new life at \$45/bbl*