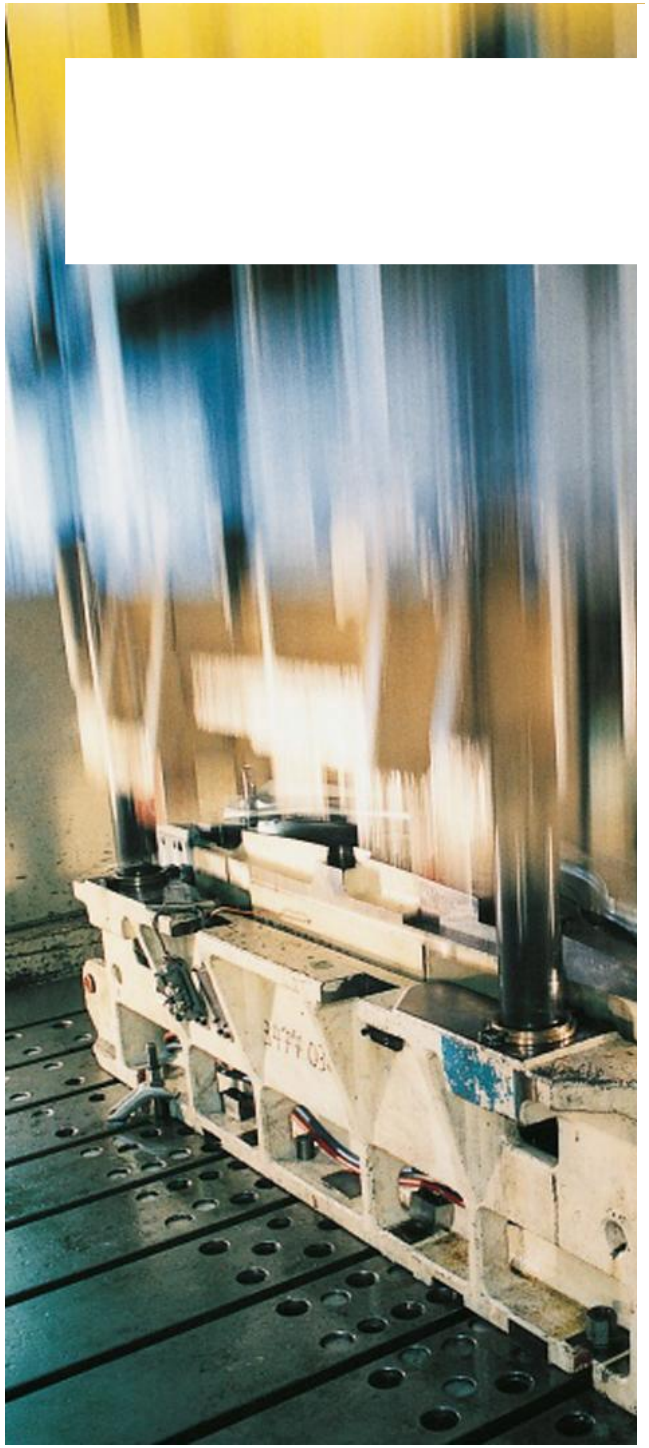
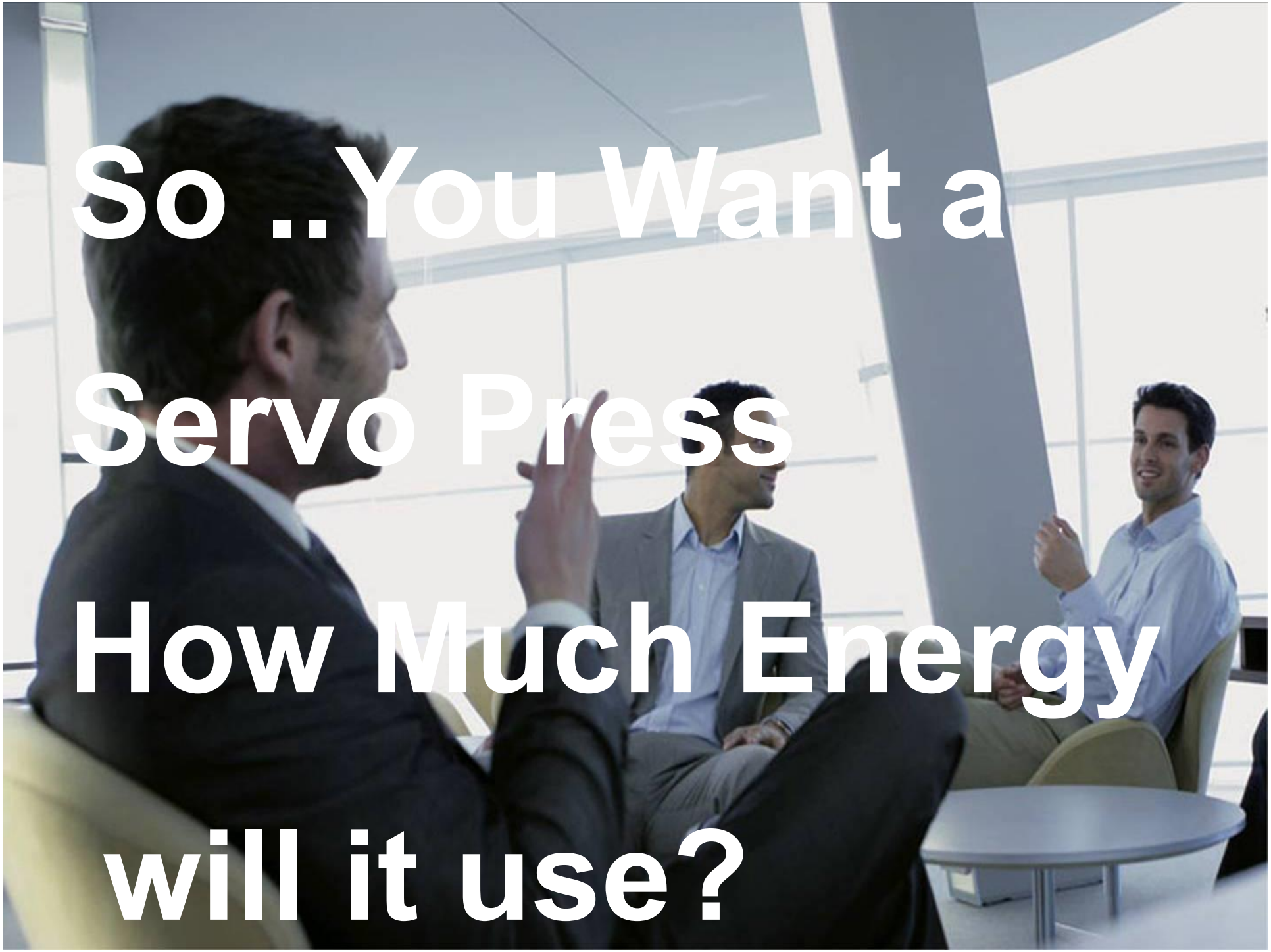


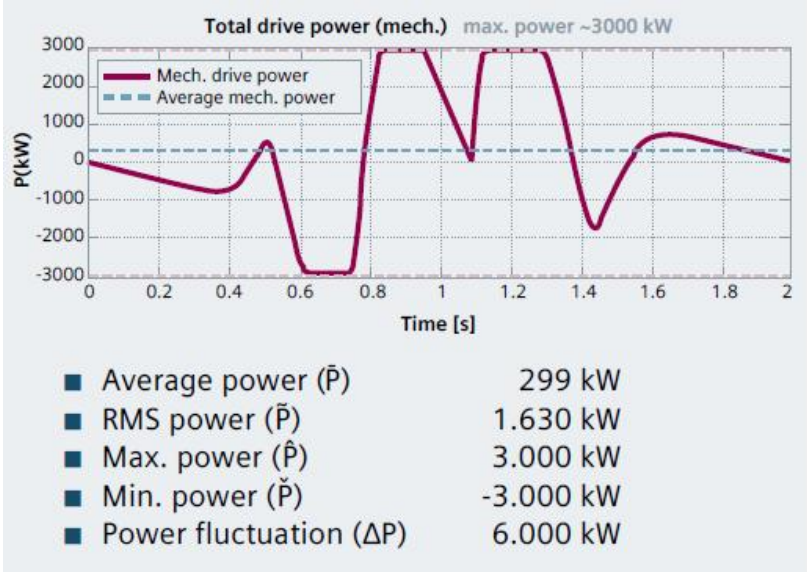
SIEMENS

Siemens Servo Press Energy Management

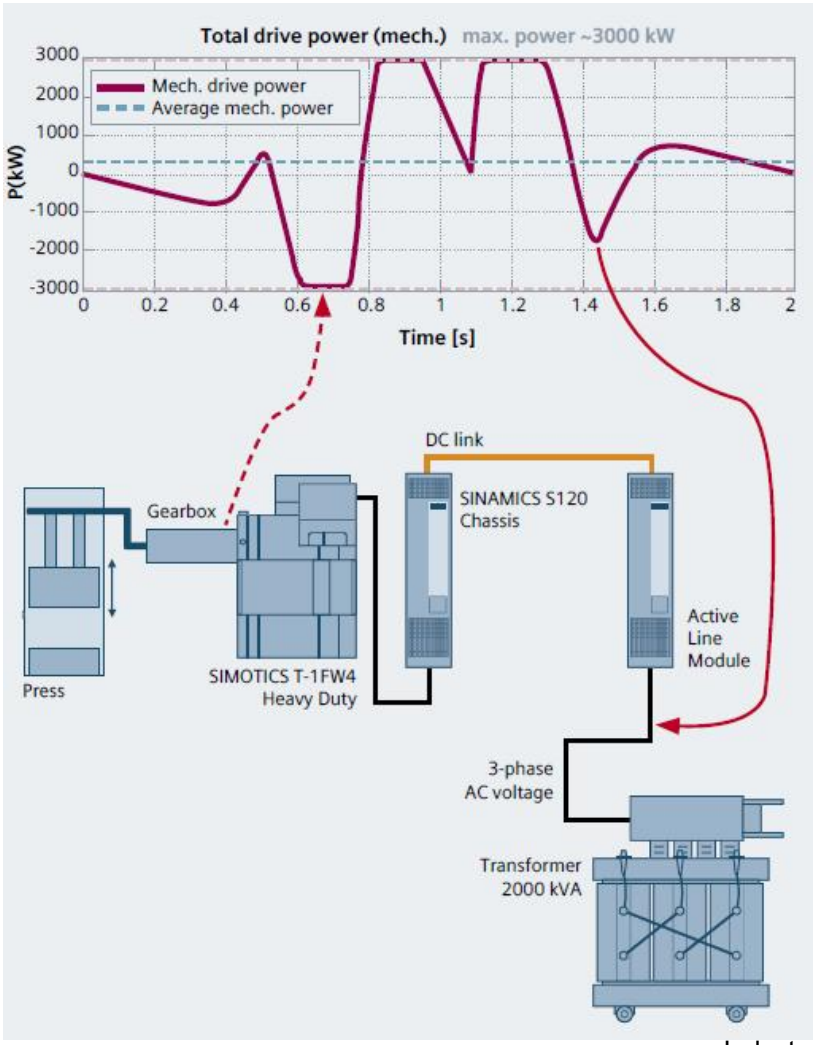
Tim Barry
Business Development
Metal Forming


So ..You Want a
Servo Press
How Much Energy
will it use?

Servo Press Power Requirements
2000t - 550kJ – 30spm



Average power ($\bar{P}$)	299 kW
RMS power ($\tilde{P}$)	1.630 kW
Max. power ($\hat{P}$)	3.000 kW
Min. power ($\check{P}$)	-3.000 kW
Power fluctuation (ΔP)	6.000 kW



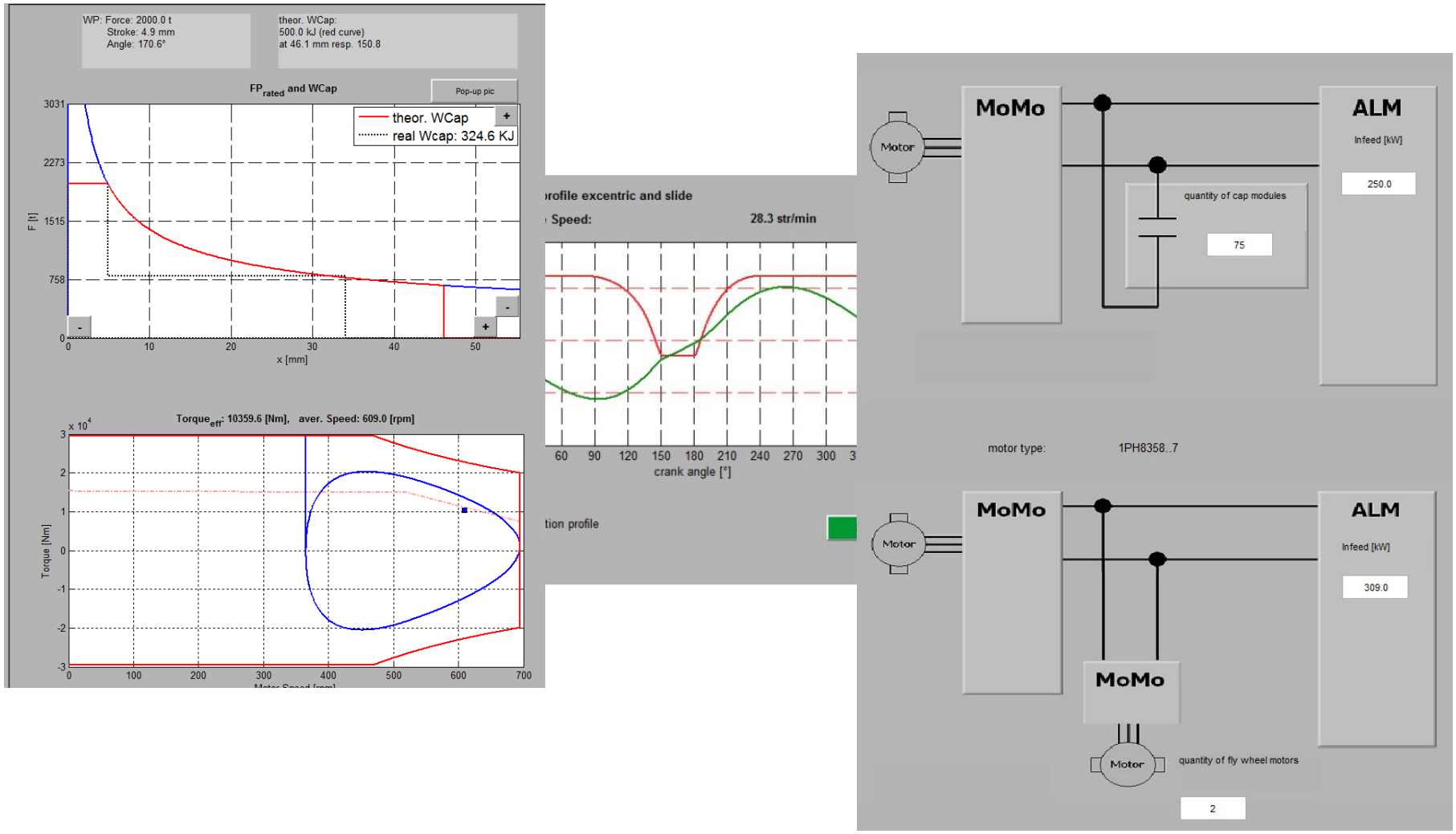
Elec Service Req'd 2400amps

3x2000 awg THHN/Phase

Transformer $$/Main Disc $$

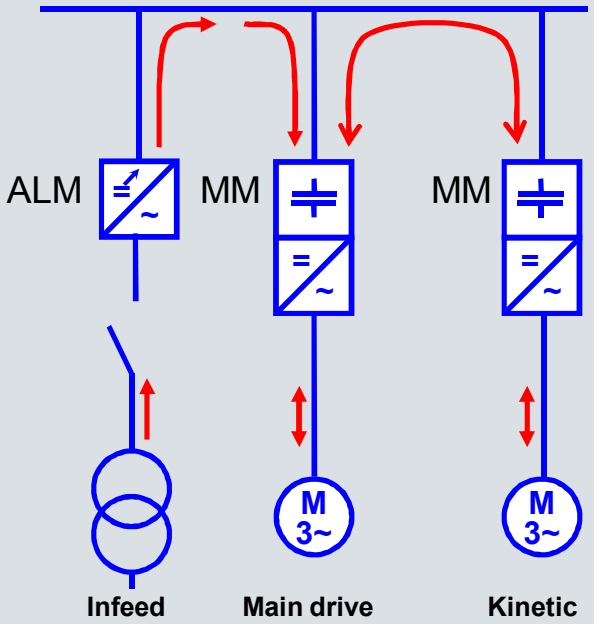
Buss Connection $$

Servo Press System Calculations



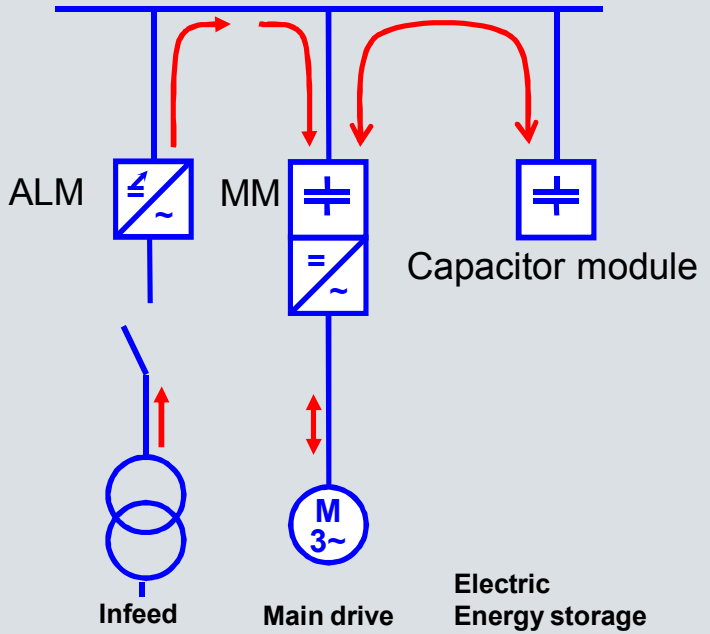
Optimized Energy Efficiency for Servo Presses for Manageable Energy Supply

Kinetic energy storage



SINAMICS S120
ALM=Active Line Module
MM= Motor Module

Electric energy storage



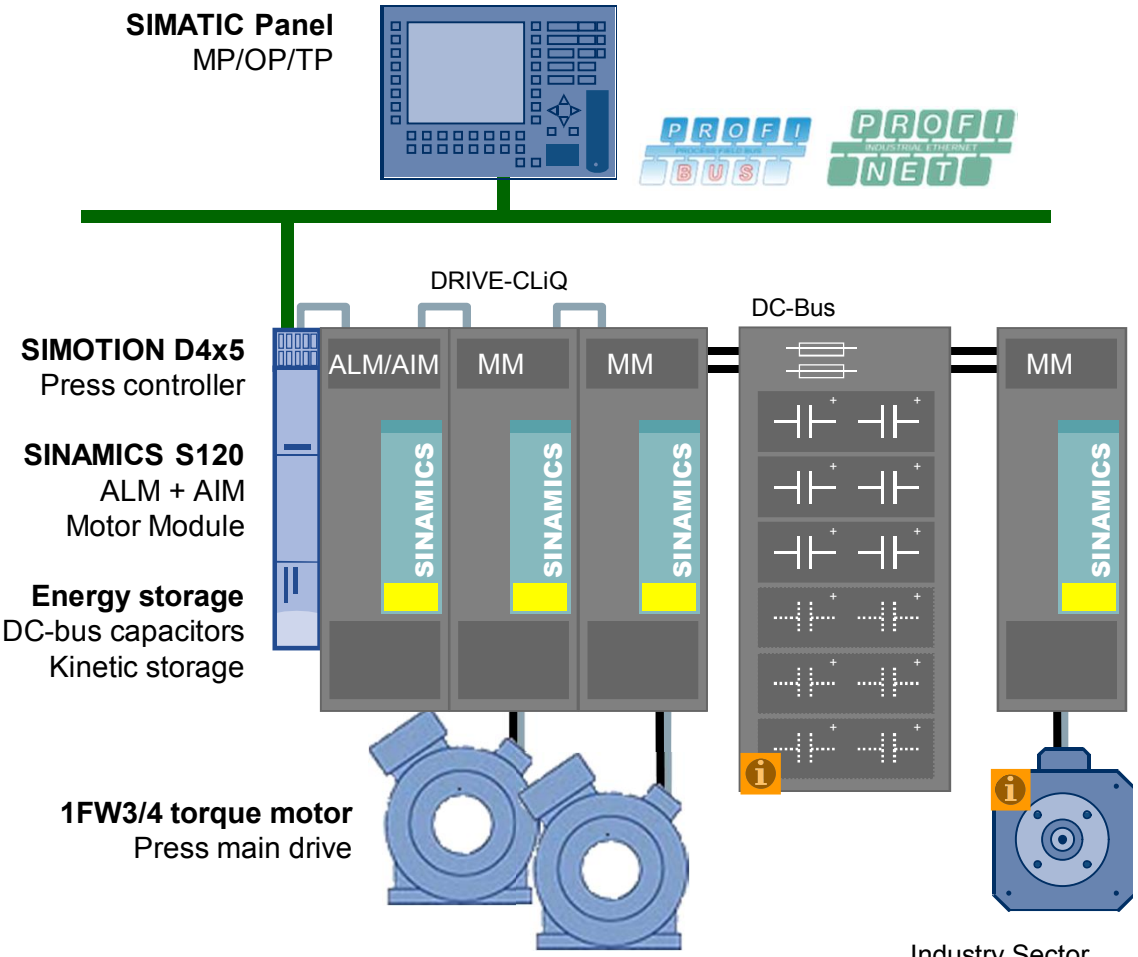
SINAMICS S120
ALM=Active Line Module
MM= Motor Module

SIEMENS

Integrated Servo Press Automation with Energy Management Systems

- ►Maximum flexibility: thanks to scalable products, systems and solutions.
- ►Designed with standard components.
- ►Pre-engineered function blocks for faster time-to-market
- ►Reduced energy consumption compared to a conventional press.
- ►The power demand from the mains supply can be engineered.

Automation example for servo presses

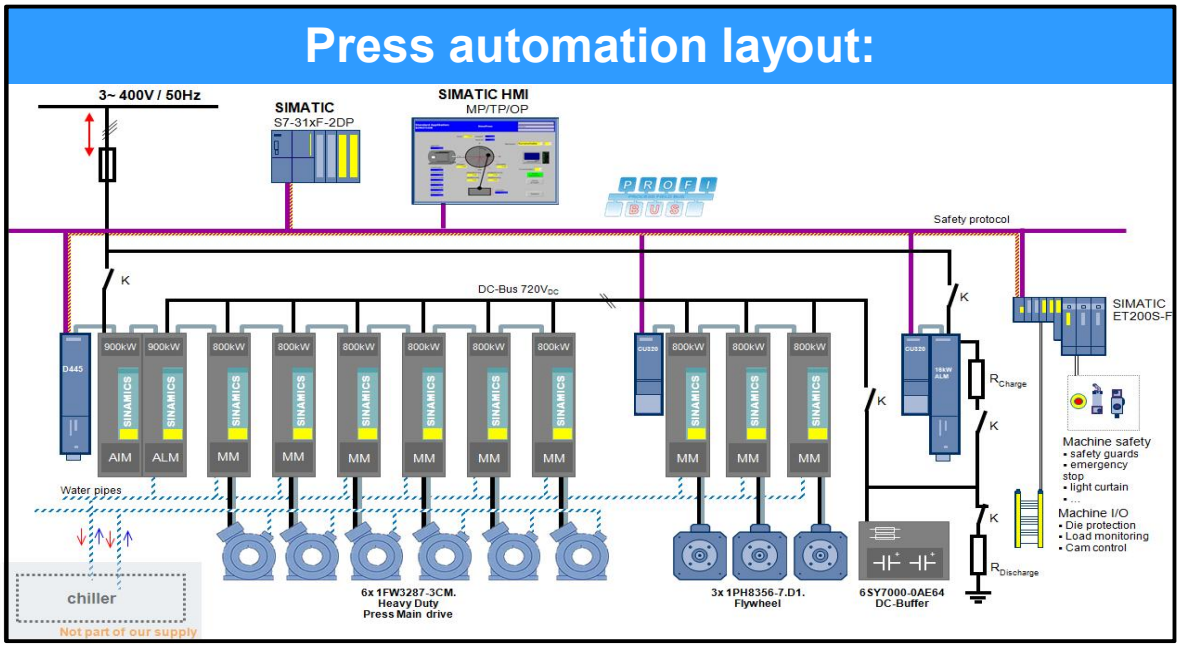


Industry Sector

Automotive reference

25,000 kN (2,750 US tons) servo press at German prime car manufacturer

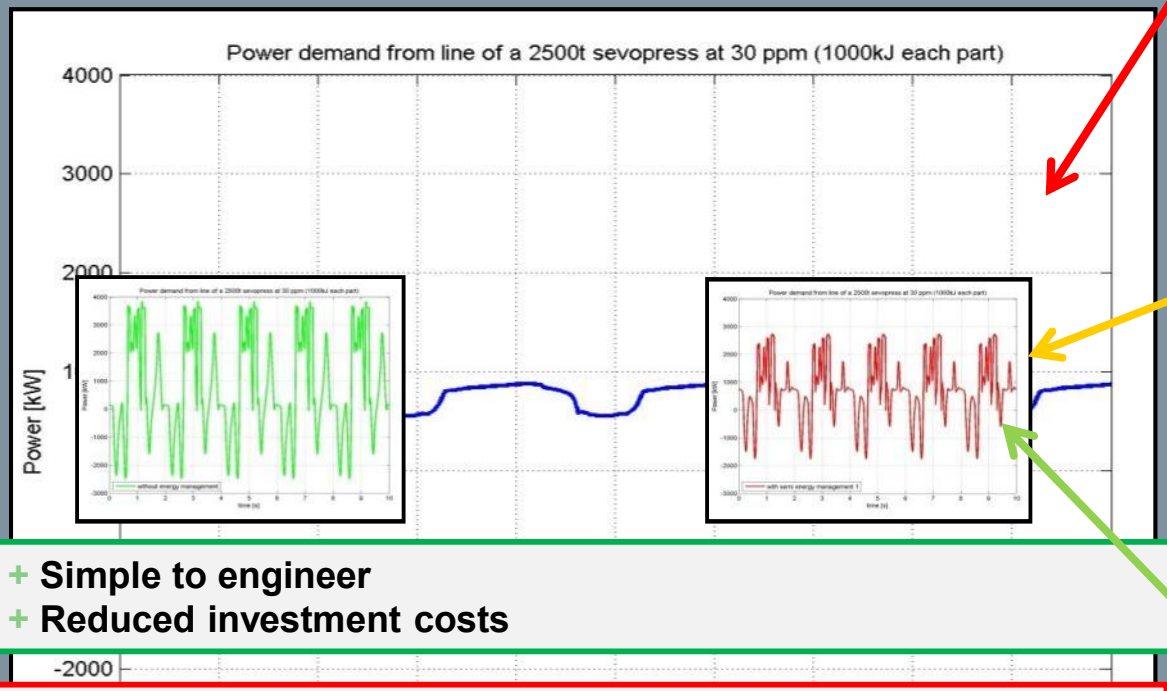
Press automation layout:



Press specification @ full force:

- Parts per minute: 30 spm
- Forming speed: max. 17 spm
- Working capacity: 1,000 kJ

Energy management systems at a glance
Example: 2,750 US tons at 30spm with 1,000kJ load at 6”



Without energy management
Nominal grid input power: **2.100 kW**

Performance parameters:
- Average power: 698 kW
- Max. input power: 3,855 kW
- Feedback power: -2,486 kW
- Power fluctuation: Δ6,341 kW

Semi sized energy management
Nominal grid input power: **1.800 kW**

Performance parameters:
- Average power: 716 kW
- Max. input power: 2,751 kW
- Feedback power: -1,755 kW
- Power fluctuation: Δ4,506 kW

Full sized energy management
Nominal grid input power: **900 kW**

Performance parameters:
- Average power: 754 kW
- Max. input power: 877 kW
- Min. input power: 558 kW
- Power fluctuation: Δ319 kW

+ **Simple to engineer**
+ **Reduced investment costs**

- **Very high oscillating load**
- **Oversized transformer**
- **Higher investment for infrastructure**
- **High line peaks and feedback to line**
- **Increased energy costs**

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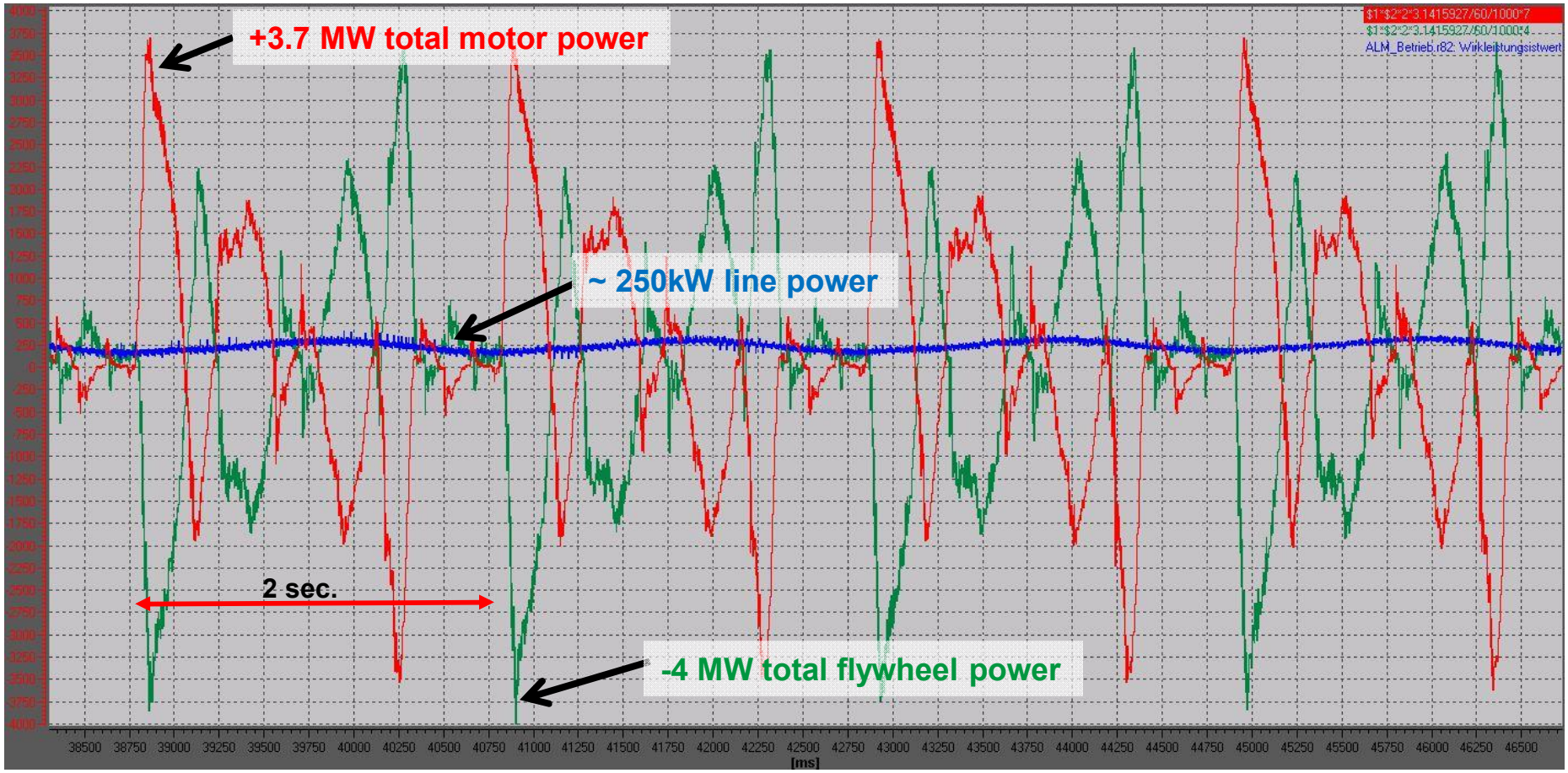
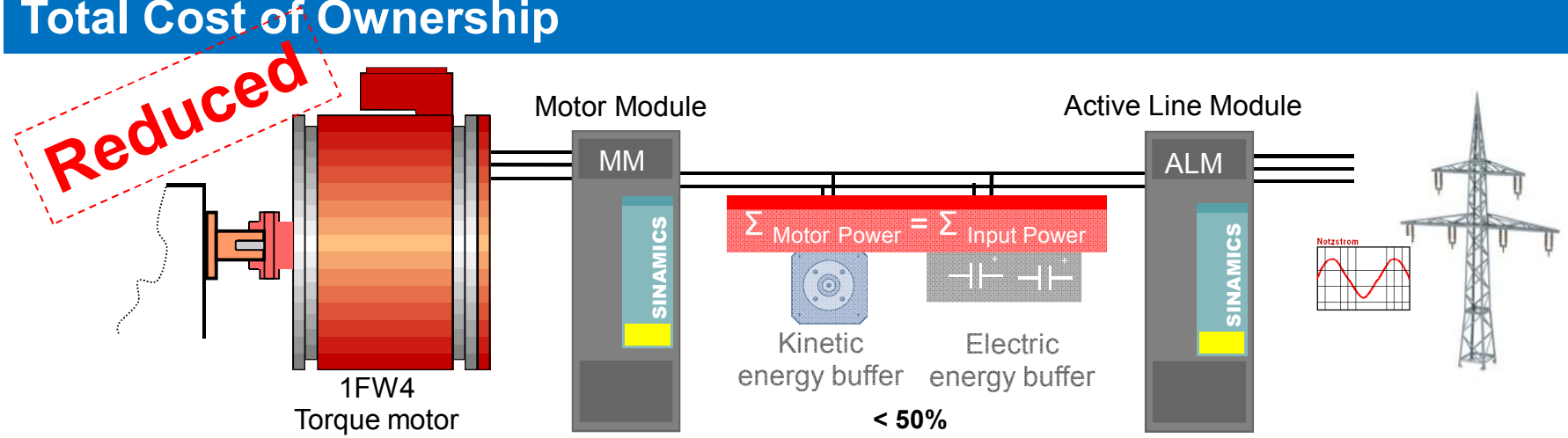
Energy management systems at a glance
Example: 2,750 US tons at 30spm



How energy is transformed from cost factor to success factor

Example: 2,750 US tons at 30spm with 1,000kJ load at 6”

Total Cost of Ownership



System:	Energy costs:
Without Energy Management :	747,980 US$/y
Semi Energy Management :	605,650 US$/y
Full Energy Management :	515,450 US$/y

-31%

-15%

Basis of calculation

- Operation: 3 shifts with 6.392 h/y
- Active energy costs: 0.09 US$/kWh
- Peak power (15min average): 9.00 US$/kW
- Direct connection to power grid.

► ***Increasing energy efficiency quickly results in companies being able to slash their energy costs by 15 percent and more – with payback times that are often less than two years.***

SIEMENS

Thank you for your attention!

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