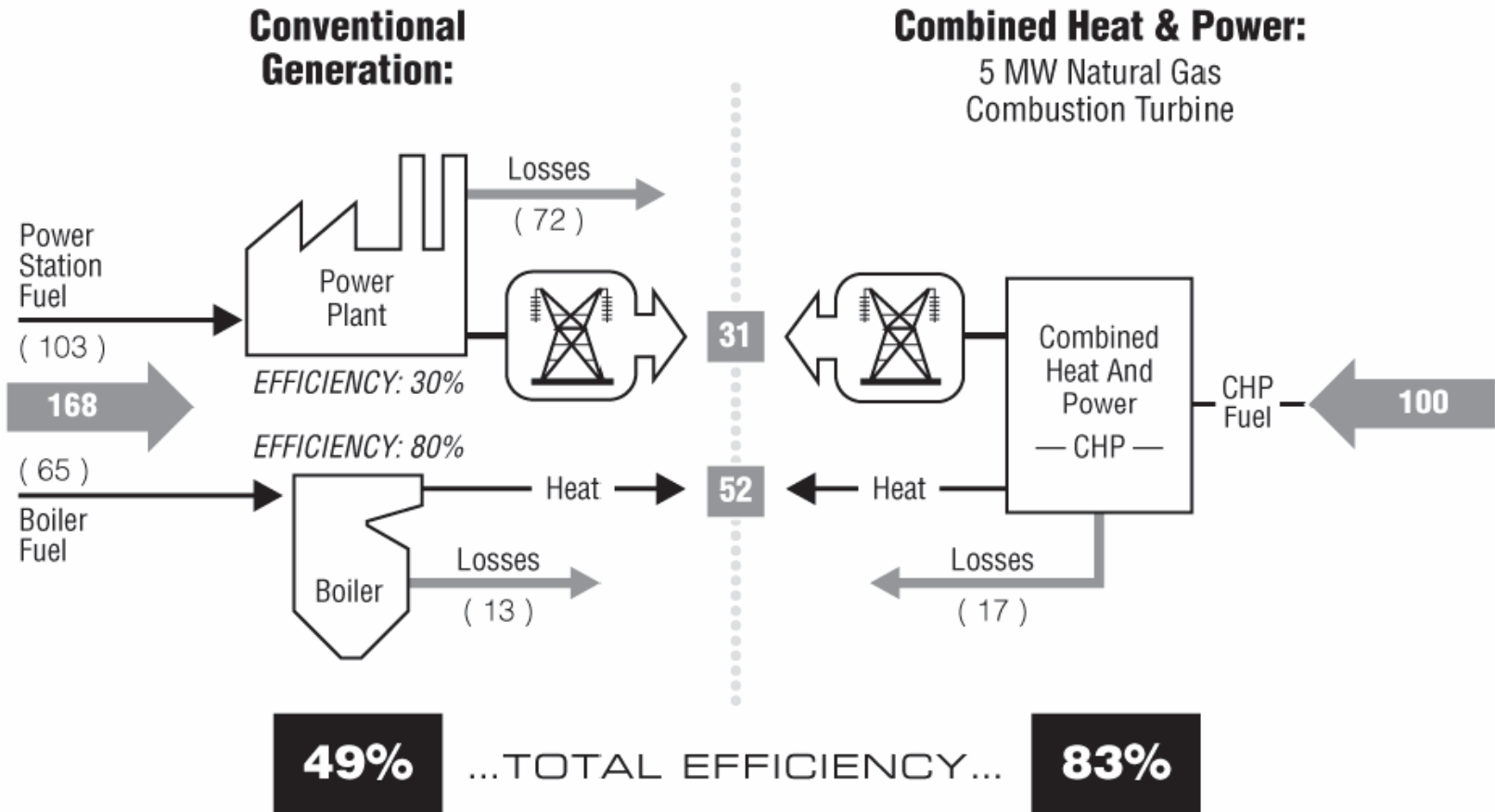




CHP Energy Savings Calculation Approaches

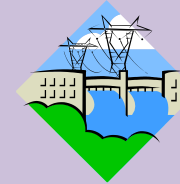
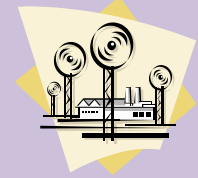
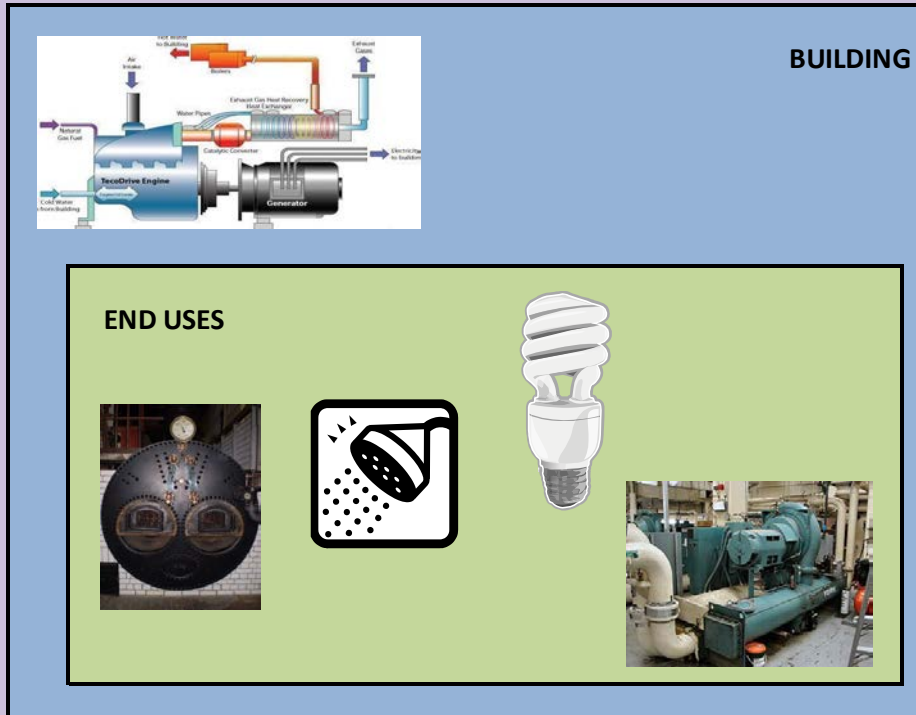
SAG CHP Subcommittee

CHP Creates “Source” Energy Savings



Reference Points for Savings

ENERGY GRIDS



Illinois Example: Key Assumptions

- **Energy Grids**
 - Electric heat rate: 10,573 Btu/kWh (eGrid fossil)
 - Electric losses: 5.82% (eGrid)
 - Overall electric grid efficiency: 30%

 - Natural gas losses: 4% (Nicor Gas estimate)
 - Overall natural gas system efficiency: 96%
- **Building/CHP System**
 - Heat rate: 9,763 Btu/kWh
 - Electrical efficiency: 35%
 - Thermal efficiency: 30%
 - Overall CHP efficiency: 65%
- **Existing End Uses**
 - Natural gas boiler: 80% efficiency
 - Electric end uses: 100% efficiency (for this example)

Illinois Example Calculation

	End Use		Building		Energy Grids		Overall Efficiency
	Output (BBtu)	Input (BBtu)	Output (BBtu)	Input (BBtu)	Output (BBtu)	Input (BBtu)	
Baseline	27	27	27	27	27	90	75%
	23	29	29	29	29	31	25%
Totals	51	57	57	57	57	120	42%
CHP	27	27	51	51	78	81	
	23	23	51	51	78	81	
Totals	51	51	51	78	78	81	62%

Total Savings:

Electric	27	48%	27	-127%	90	232%
Natural Gas	29	52%	(49)	227%	(51)	-132%
Total	57		(22)		39	

Tracked Savings:

Electric	All Positive Savings:	27	Allocate 75%:	29
Natural Gas	No Negative Savings:	0	Allocate 25%:	10