

# Systems Engineering Case Study: Wafer Handling for Solar Cell Production Equipment

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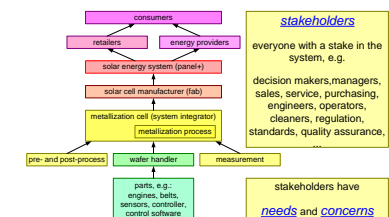
## Abstract

This presentation provides a case study of the application of Systems Engineering in cascade of companies. The case study is artificial to avoid confidentiality issues, where elements from multiple real case studies are combined.

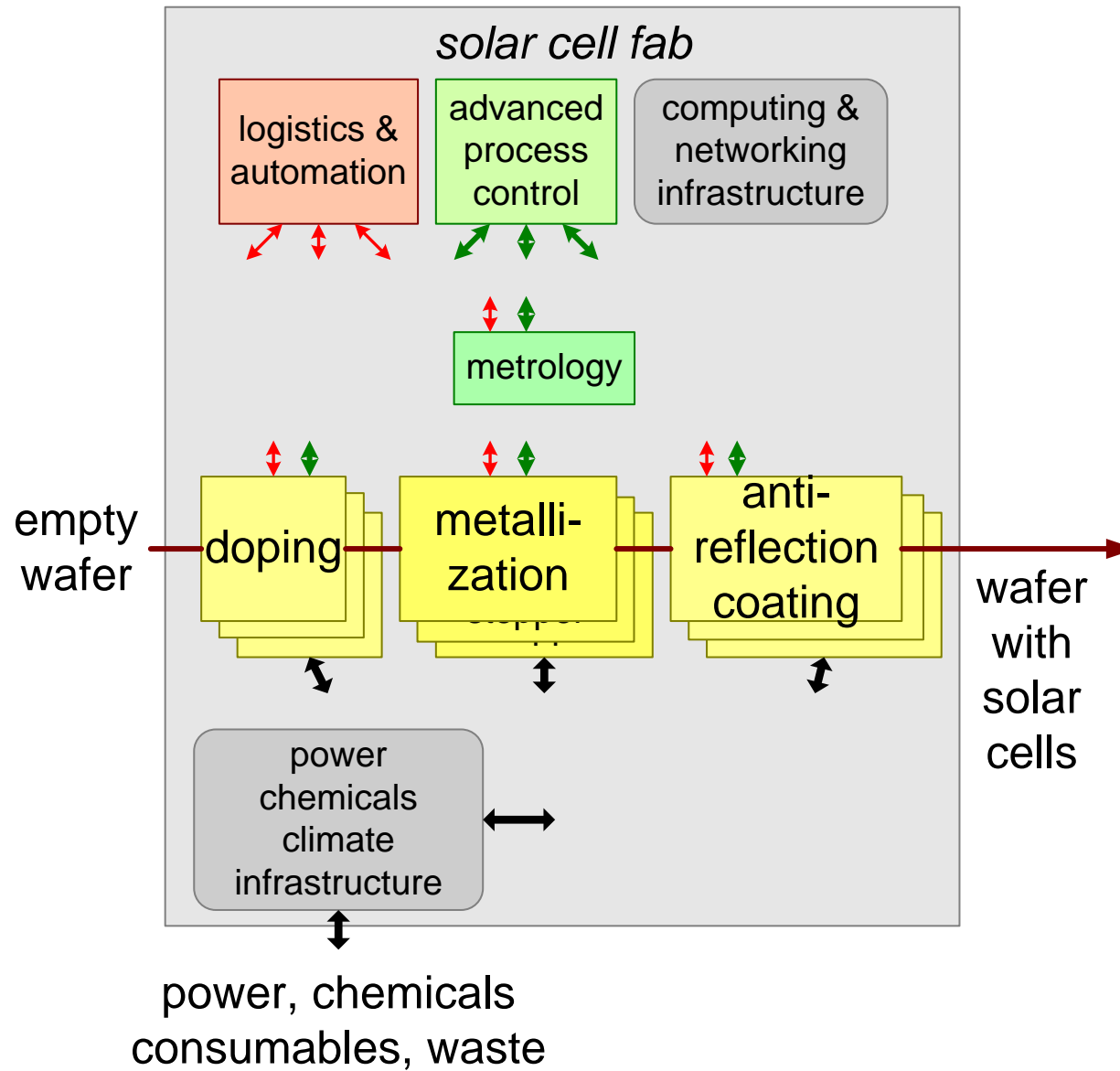
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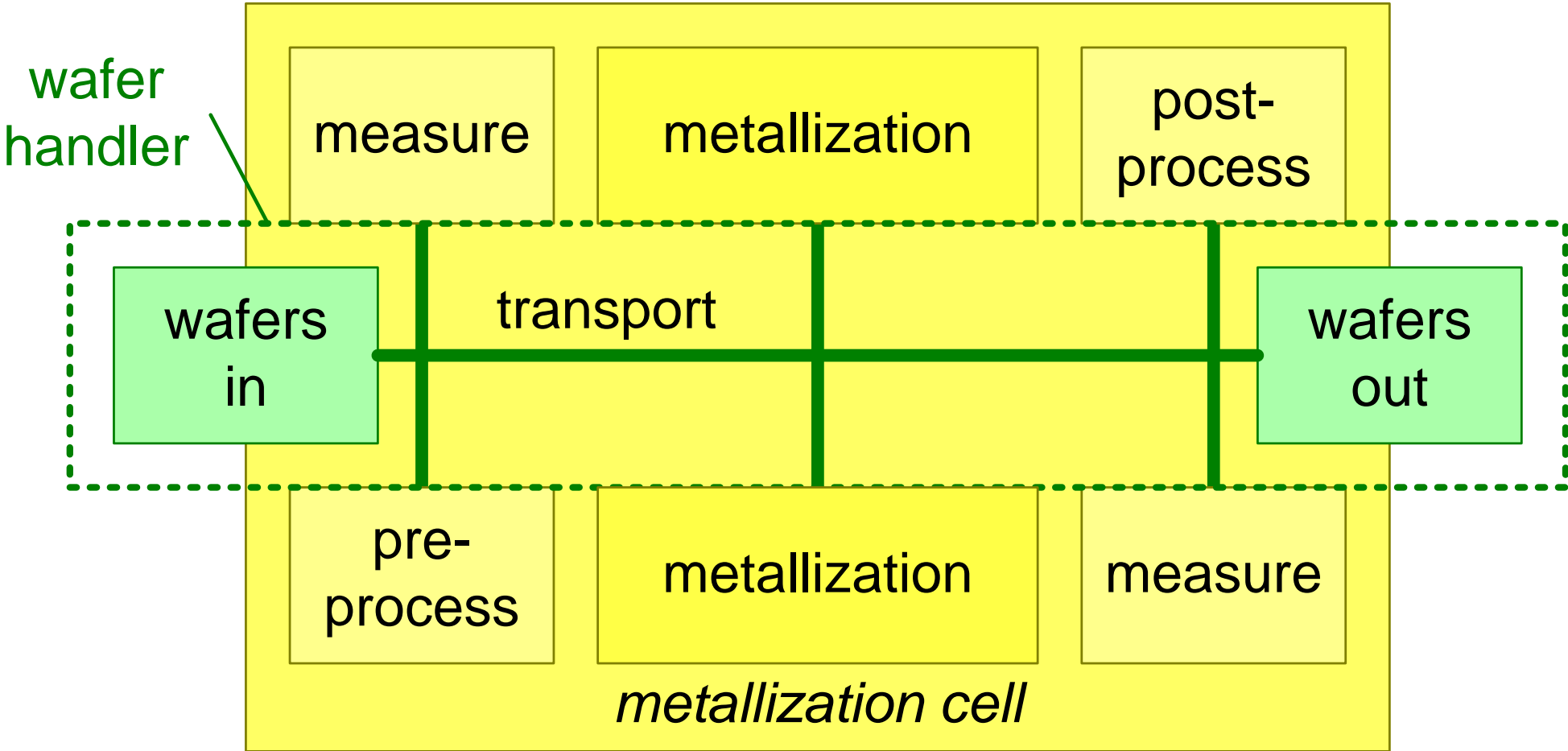
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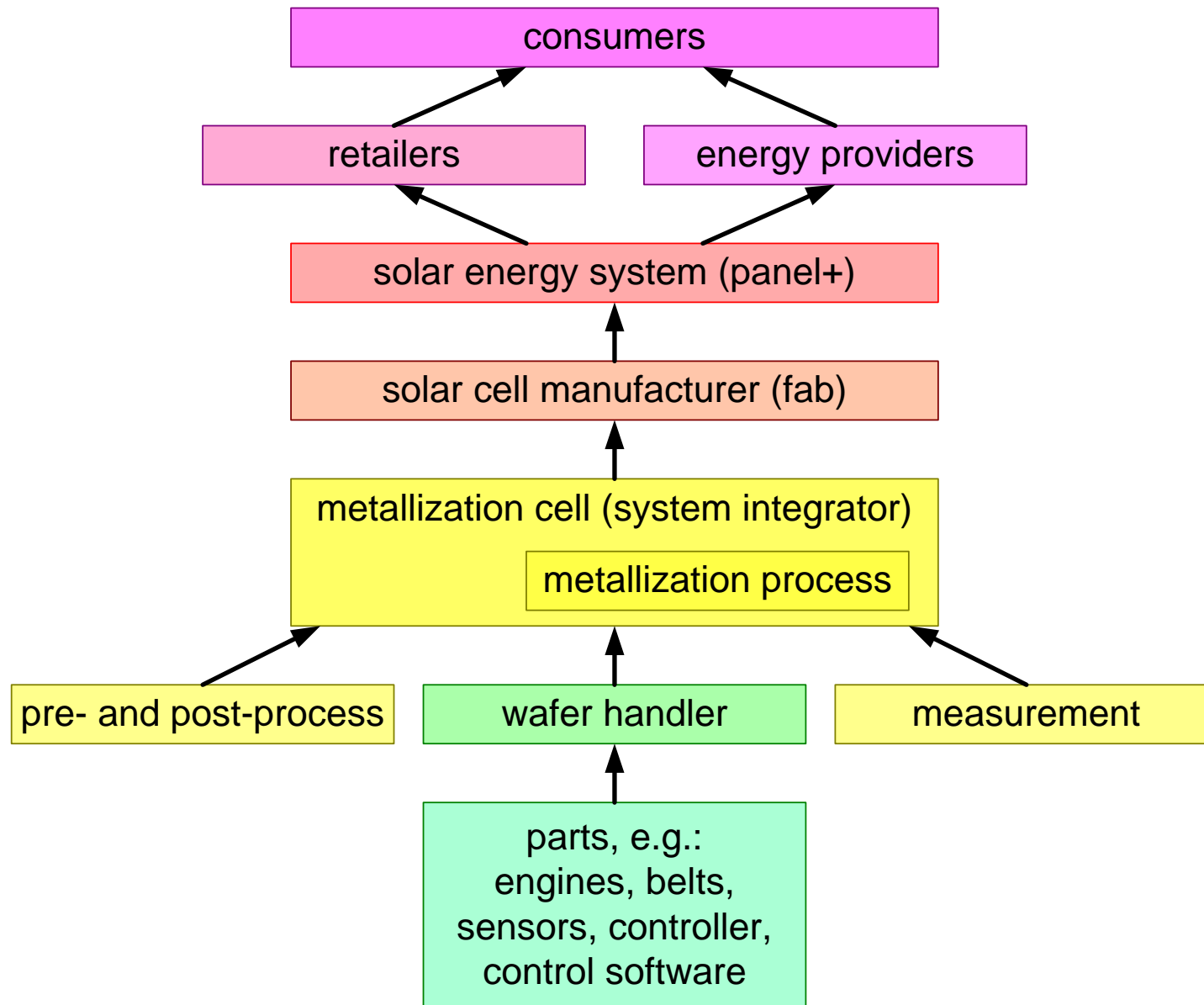
# Solar Cell Wafer Fab



# Metallization Cell



# Value Chain

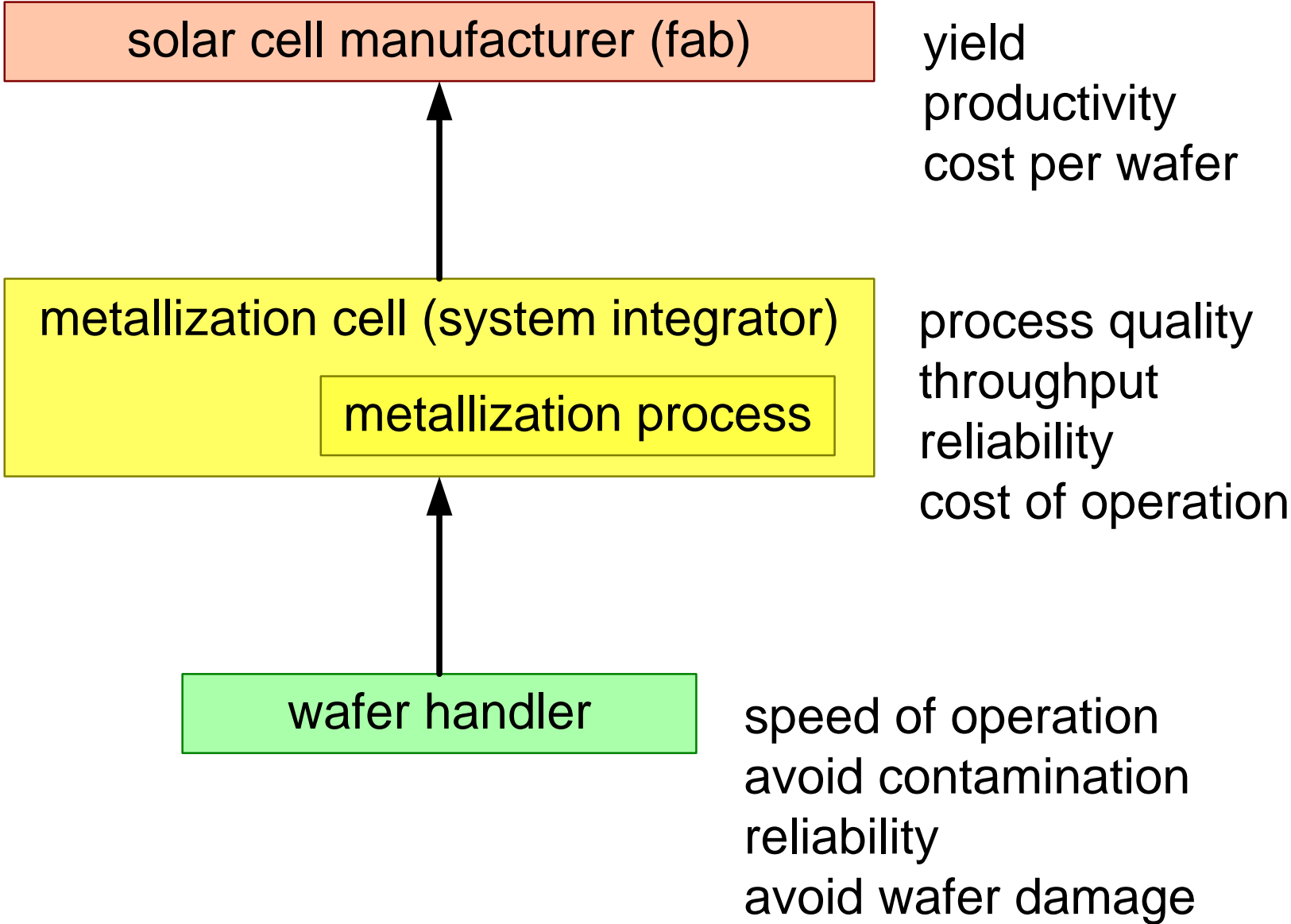


# Trends of past Decades

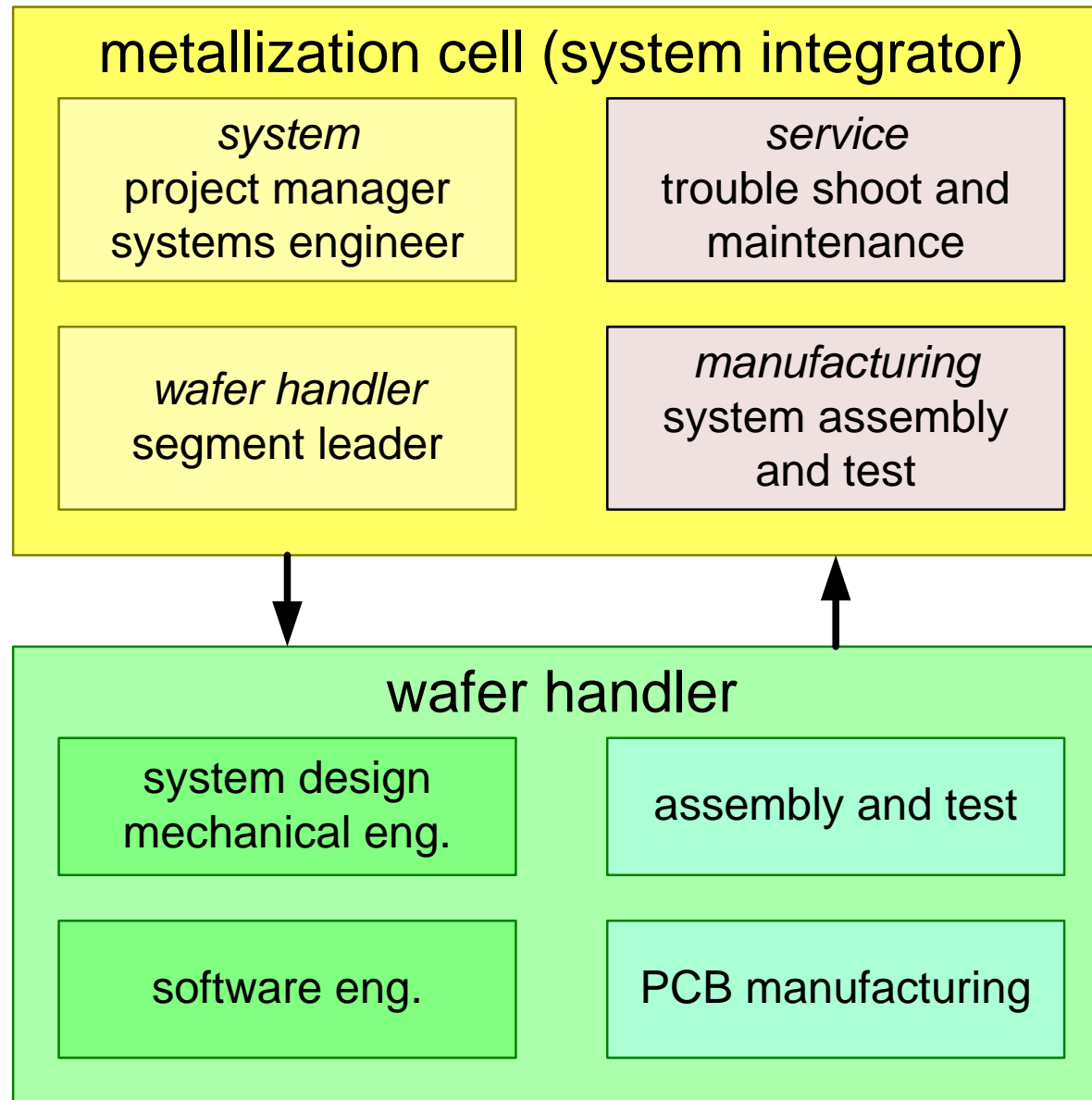
	2000<	2000-2010	>2010
transportation	manual	semi-manual	automated
operation	manual	remote	automated
process control	expert	statistical	advanced
process complexity	medium	medium-high	high
contamination and climate	strict	stricter	very strict microclimates

technology disciplines	chemical, mechanical dominant	much more electronical, software
number of people in development	tens	hundreds
integration	loosely	tight; also at fab
rate of change	years	months

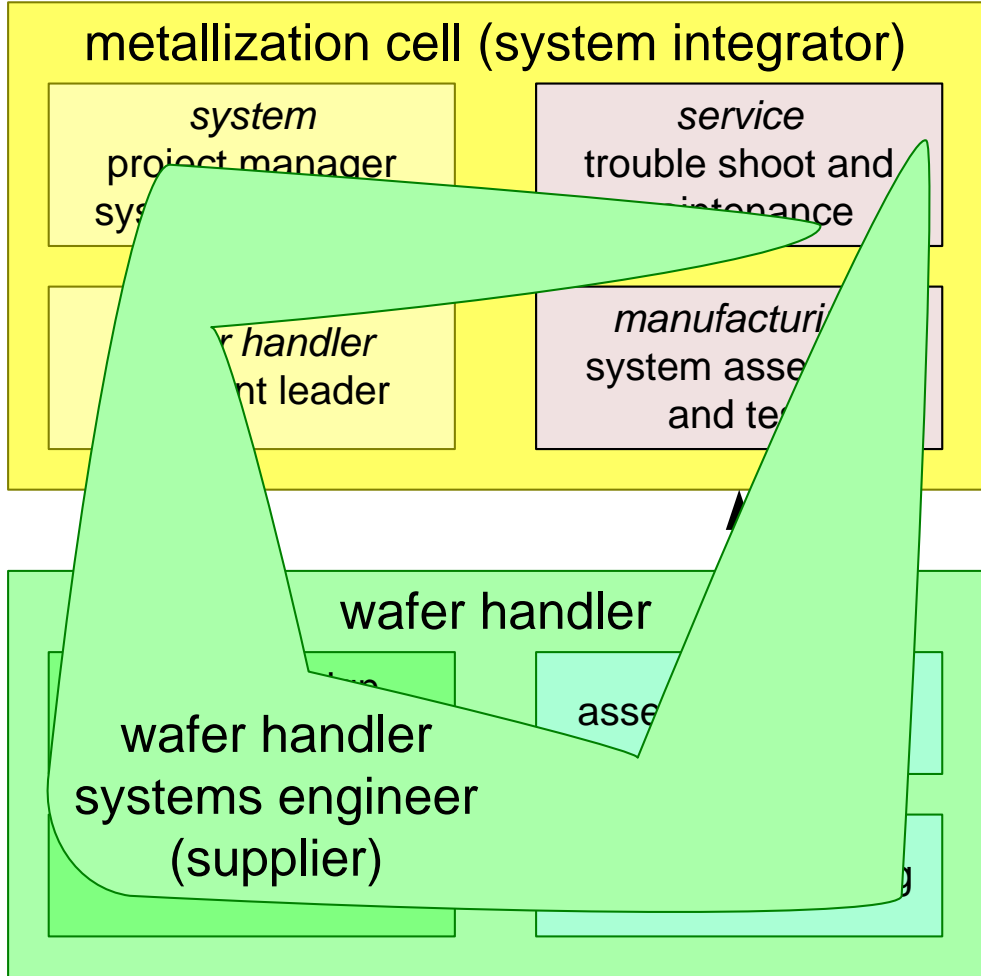
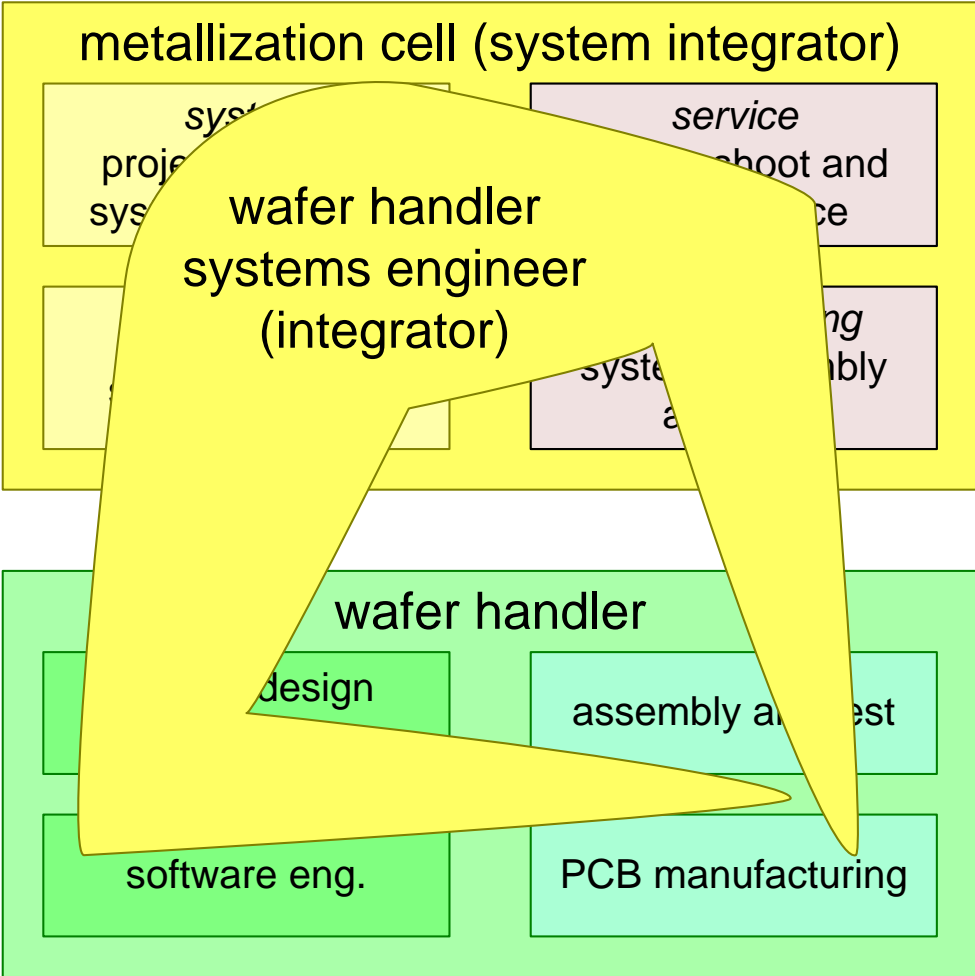
# Key Drivers and Parameters



# Suppliers involved in Wafer Handler



# SE roles in Integrator and Supplier



# Multiple Life Cycles

