

RTP for Solar Cell Fabrication



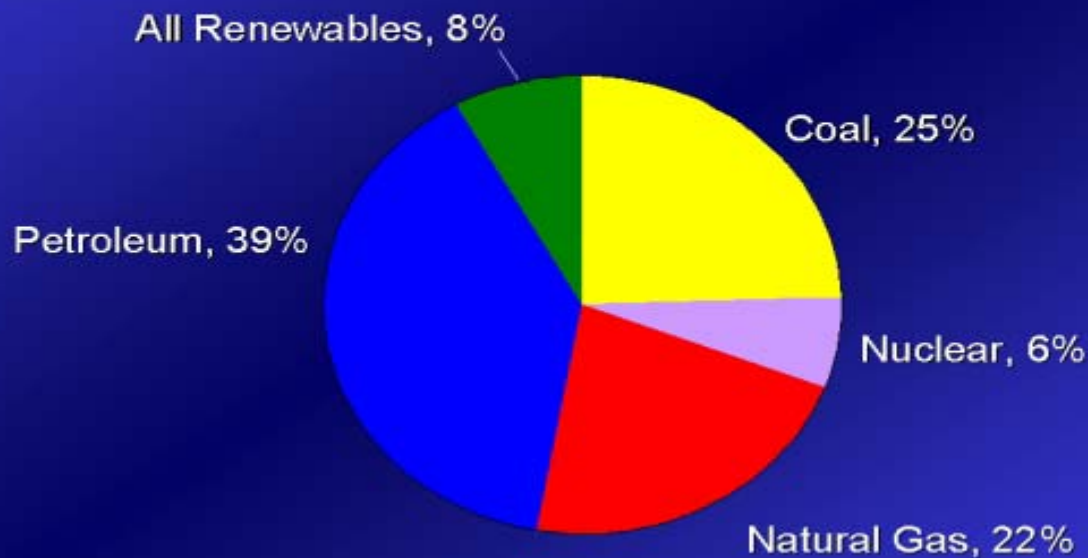
ECE 6450

Dr.Doolittle

Kenta Nakayashiki

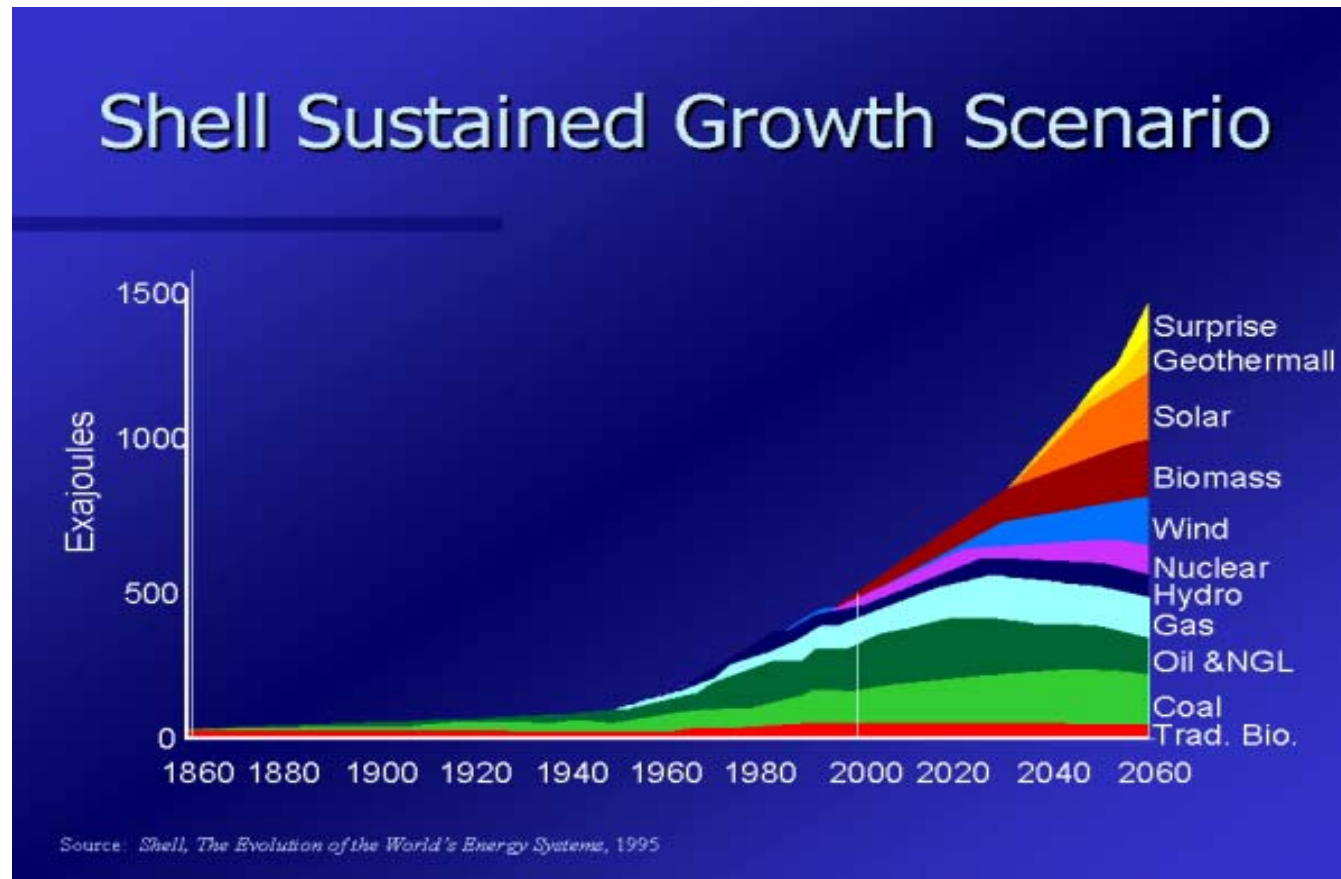
Energy Outlook - Current

Worldwide Energy Consumption By Source - 1997



Source: Energy Information Administration, *International Energy Outlook 2000*, Table A2

Energy Outlook - Projected



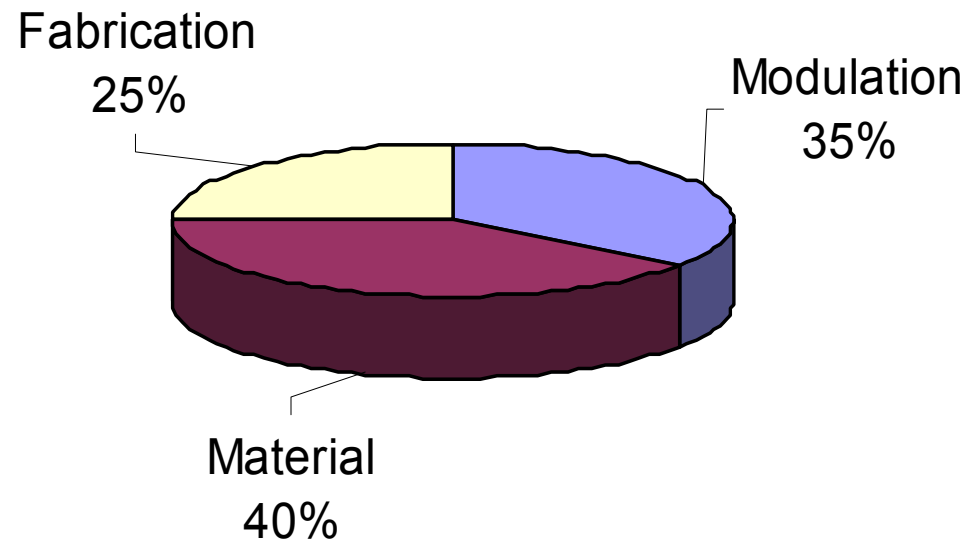
Fuel Reserves - Projected

■ Oil	41 years
■ Coal	330 years
■ Uranium	113 years
■ Natural Gas	120 years
■ Sun Light	Forever

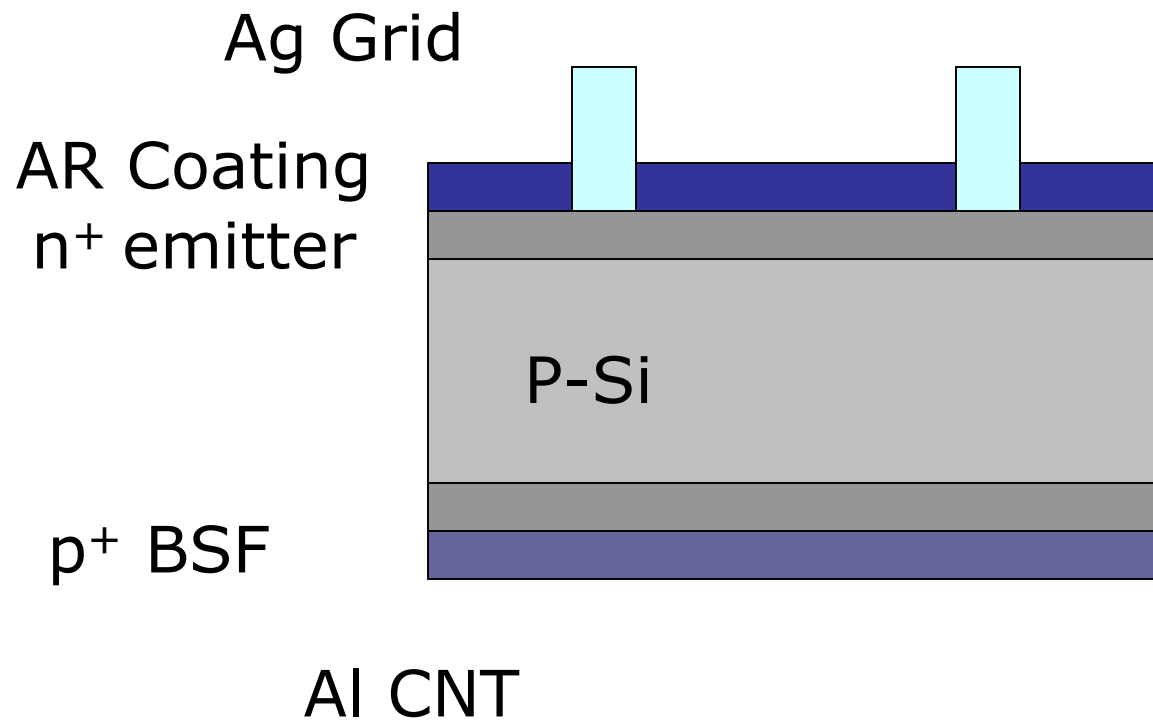
Advantages

- Energy Source
 - Free
- NO Toxic Emission
 - Greenhouse Gas
- Photovoltaic Effect
 - Direct Conversion
- Territorial Use
 - Bridge Gap

Costs of Solar Cell



Cell Fabrication



Belt Line Process

- Advantage

- High Throughput

- Disadvantages

- Temperature Control
- Wafer Temperature
- Low Ramp-up, -down Rate

Rapid Thermal Process

■ Advantages

- Temperature Control
- Actual Wafer Temperature
- High Ramp-up, -down Rate
- Clean Process

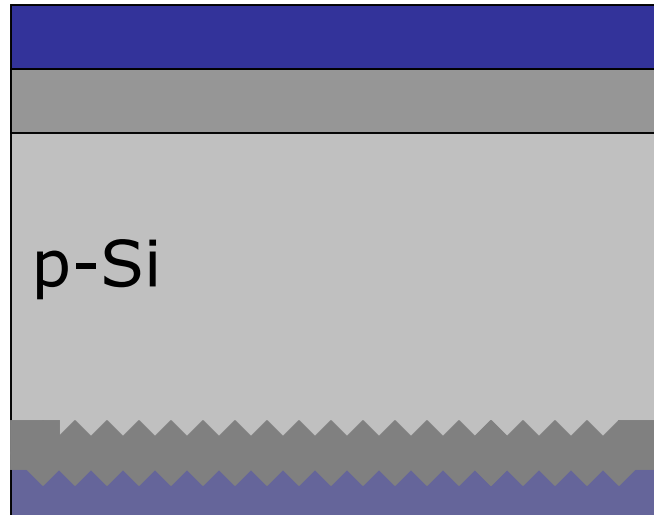
■ Disadvantage

- Low Throughput

BSF Region (Belt Line)

AR Coating

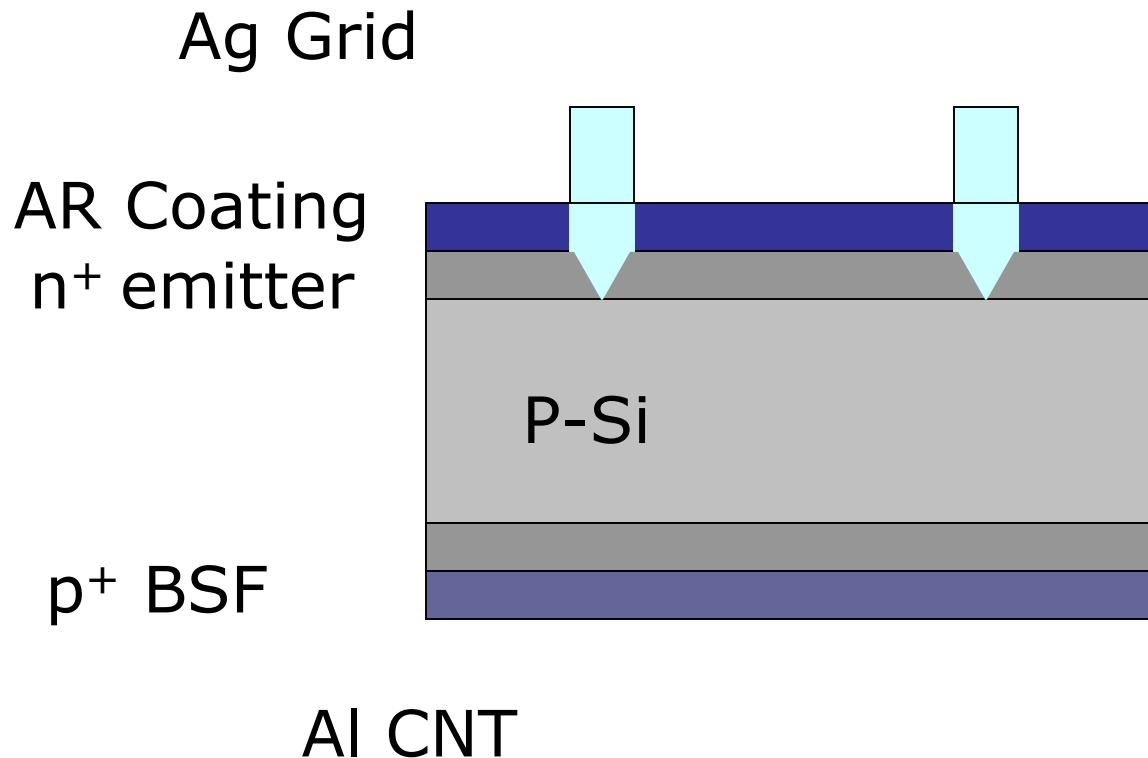
n^+ emitter



p^+ BSF

Al CNT

Grid Contact (Belt Line)



Conclusion

- Throughput
 - Large Area Wafers ($\sim 20''$)
- Process Quality
 - Inside Chamber
- High Ramp-up, -down Rate
 - High Quality BSF, Grid Contact

References

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<http://www.nrel.gov/silicon/index.html>, December 1999
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