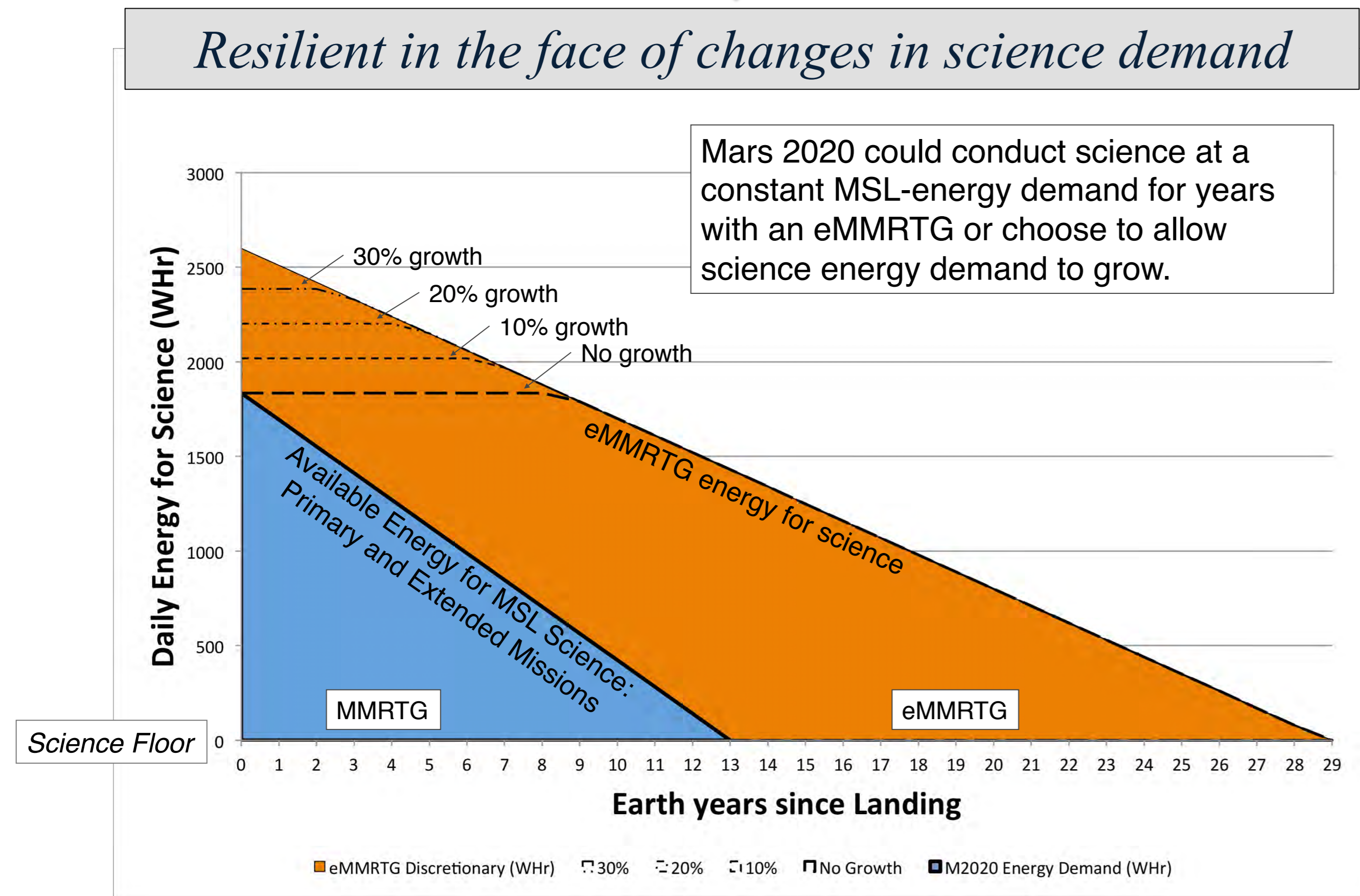
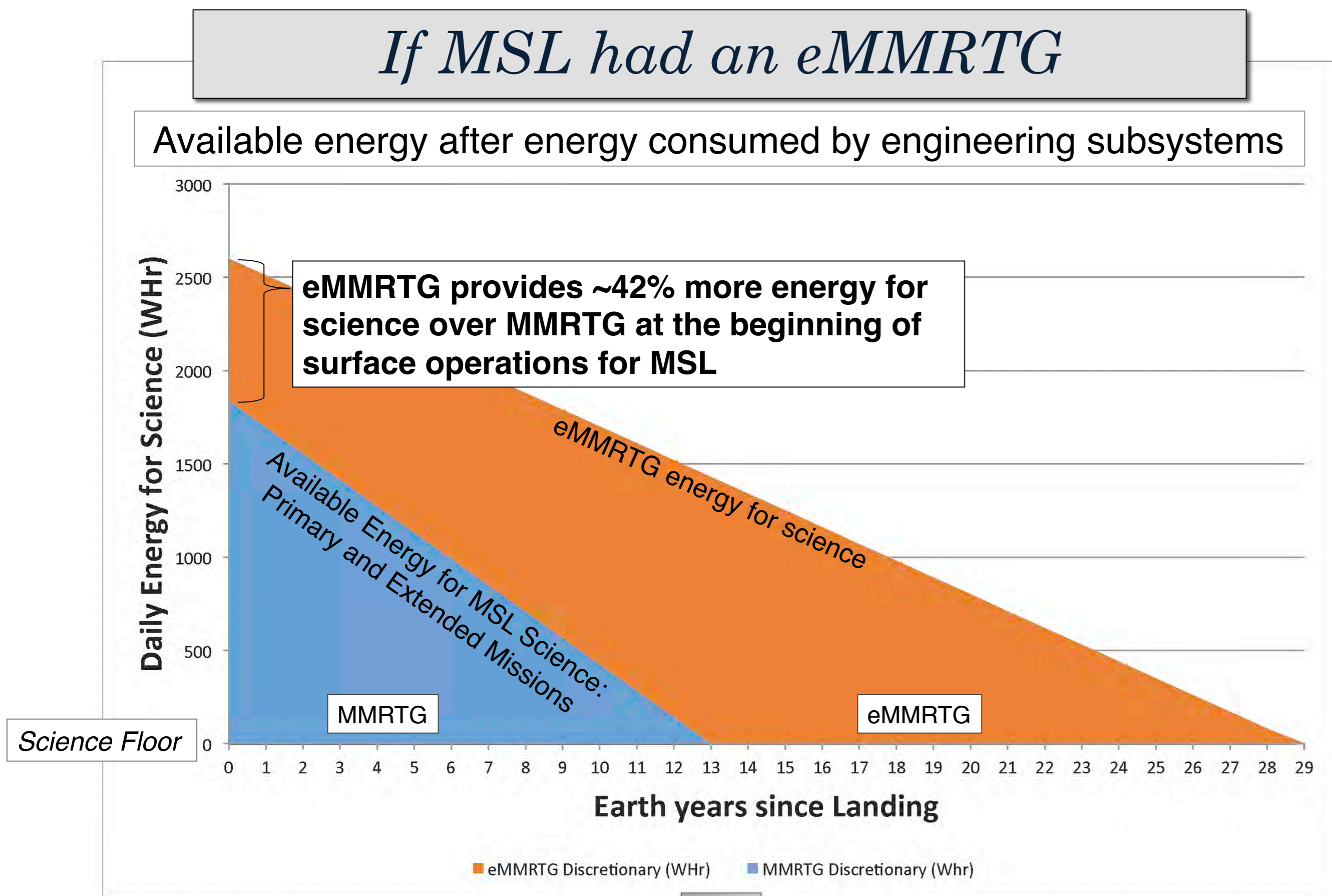
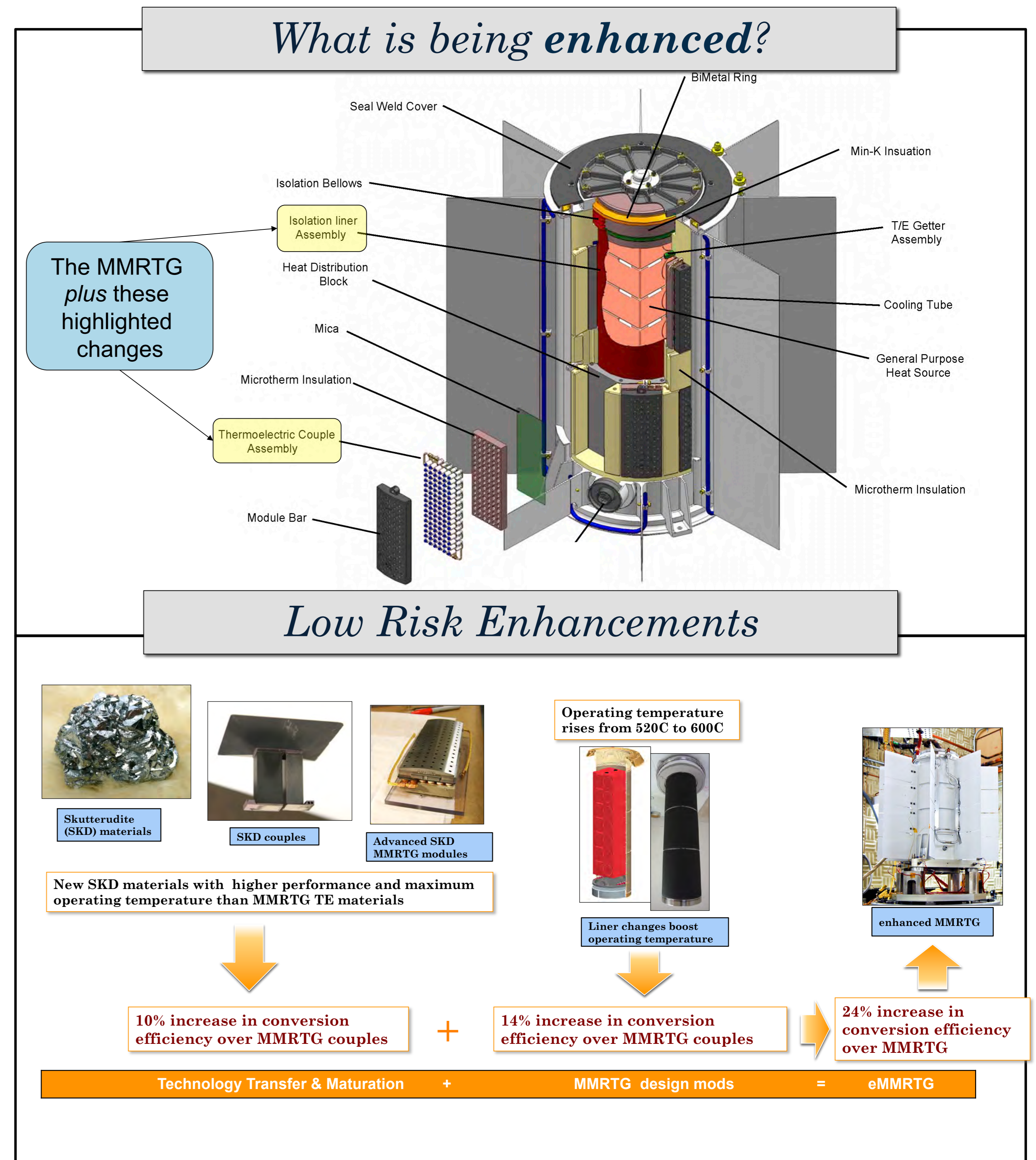
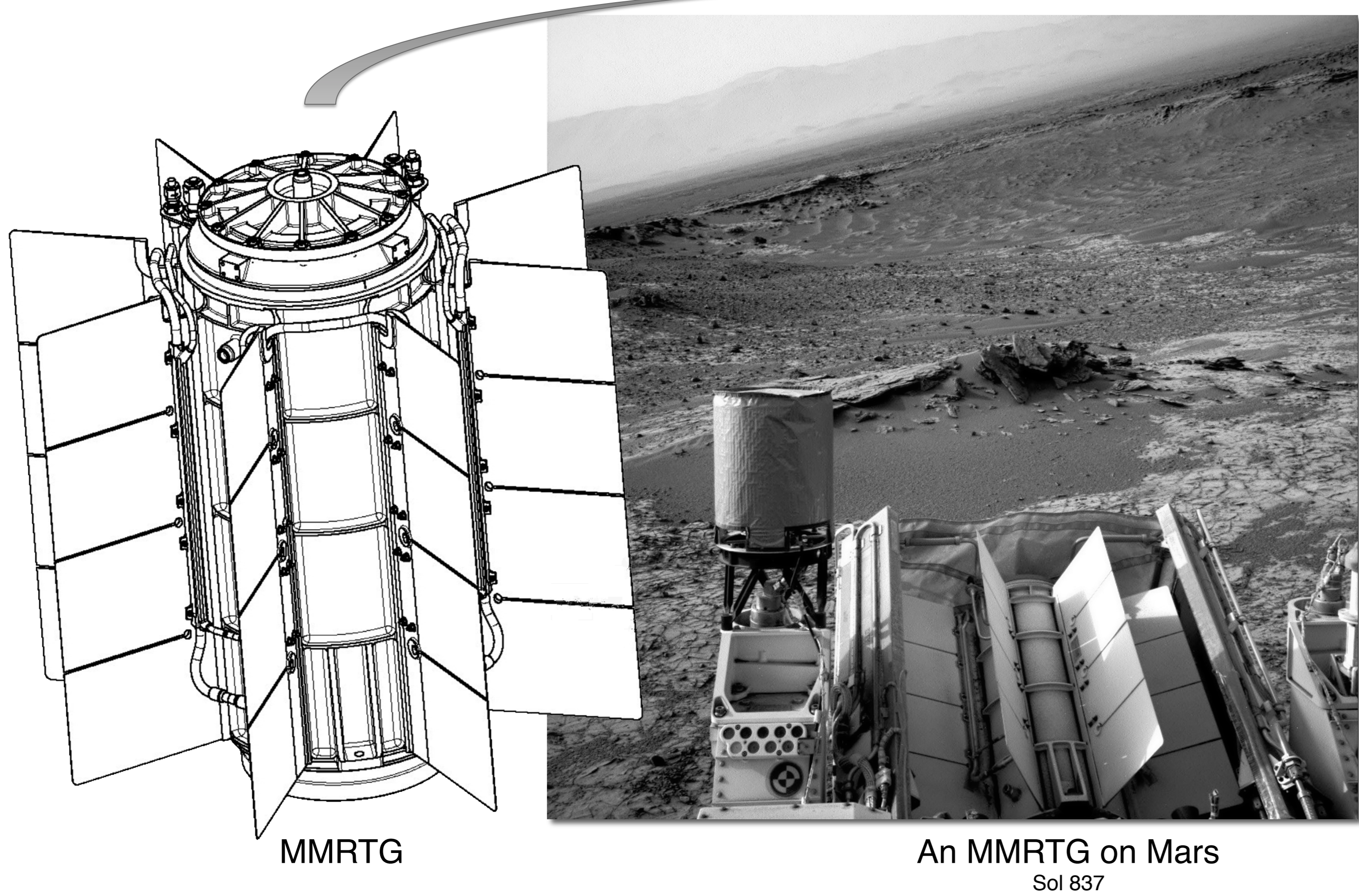


30W Boost in MMRTG Power Delivered at Beginning of Life & 50W at End of Design Life

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| | MMRTG | enhanced MMRTG | enhancement |
|----------------------|----------------|------------------------------------|-------------|
| BOL Power (W) | 124 * | ~154 ** | 24% |
| Power at EODL (W) | 55 | ~101 | 84% |
| Degradation Rate *** | 4.8% | 2.5% | ~ 2x |
| No. of GPHS Bricks | 8 | 8 | |
| System Mass | 44.1 | 44.1 | |
| Hot Junction Temp | 520 °C | 600 °C | |
| Cold Junction Temp | ~200 °C | ~200 °C | |
| Mission Usage | Multi-Mission | Multi-Mission | |
| Development Risk | None | Low - Moderate | |
| Addressed Program | MSL, Mars 2020 | Discovery, New Frontiers, Flagship | |

BOL - Beginning Of Life, fueling
EDL - Entry, Descent, and Landing
EODL - End Of Design Life, 17 yrs from BOL

* 28V, Thermal Inventory = 244 Wth; 4k thermal sink
** 32V, Thermal Inventory = 244 Wth, 4k thermal sink
*** Steady-state thermal sink, Mars hot case

Operations Considerations

1. Graceful degradation
2. Quiescent power
3. Rugged for landings
4. Operates in atmosphere and the vacuum of deep space
5. Radiation tolerant to 1 Mrad+
6. Waste heat to reduce demand for spacecraft electrical heat.
7. Self-sterilizes for planetary protection

Five Take Away Points

1. Increased EODL power, >50% more than MMRTG
2. Enhanced performance in a flight-proven package
3. Meets multi-mission needs
4. Can power most missions in PSD's Decadal Survey
5. Built to last

