Advanced Manufacturing

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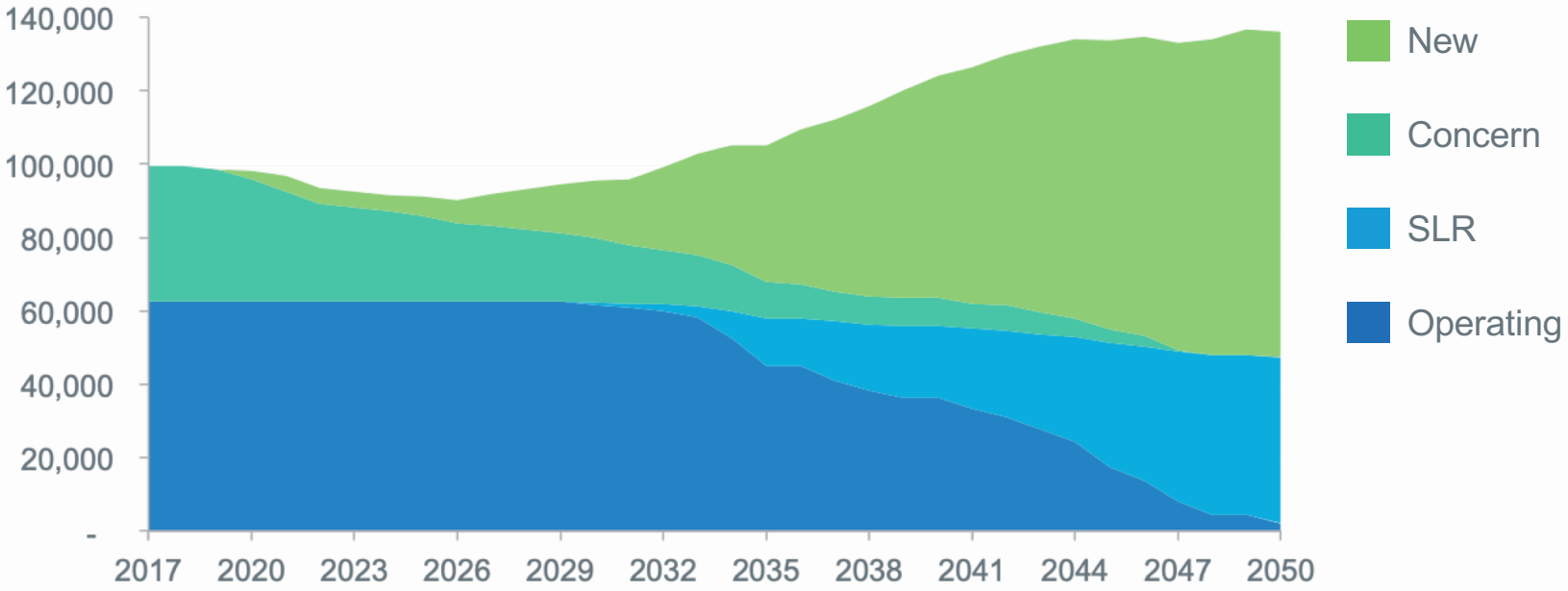
December 4, 2018

NUCLEAR ENERGY INSTITUTE

Scale of New Build Needed to 2050

Even with subsequent license renewal, retaining 20% market share in 2050 requires adding ~60-90 GW



Costs are headwinds for nuclear reactors

	First of a Kind SMR	NOAK SMR	NGCC
Facility Size	400 MWe (200MWe x 2 units)		550 MWe
Construction Time	42 months (including 6 months for start-up)		33 months
Deployment Year	2026	2030	2026
Overnight Capital Cost	$5,150/kWe	$4,600/kWe	$1,210/kWe
O&M Costs (2017$)	Fixed O&M: $135/kW-yr Variable O&M: $3/MWh Fuel: $8.5/MWh (includes costs of used fuel disposal at $1/MWh)		Fixed O&M: $27/kW-yr Variable O&M: $4/MWh Fuel: $3.75/Mbtu (equals $24.7/MWh)

Source: SMR Start Economic Analysis

Areas for Cost Improvements

Table 2.2: Cost breakdown for various LWRs

	Cost Breakdown (% of total cost)				
	Generic AP1000	Historic U.S. LWR Median Case	Historic U.S. LWR Best Case	South Korean APR1400	EPR
Nuclear Island Equipment	12.6	9.9	16.5	21.9	18.0
Turbine – Gen. Equipment	4.9	7.0	11.9	5.6	6.3
Yard, Cooling, and Installation	47.5	46.3	49.3	45.5	49.7
Engineering, Procurement, and Construction Cost	15.9	17.6	7.7	20.0	15.3
Owner's Cost	19.1	19.2	14.6	7.0	10.7

Source: MIT Future of Nuclear Study

VISION FOR ADVANCED MANUFACTURING

- Produce components faster and cheaper
- Enable components with enhanced performance
- Rapidly commercialization of new technologies

