Small Modular Reactors (SMRs), Solar and Wind
Which technology has more clear advantages (shown in green)?

Parameter	SMR	Utility Scale Solar	Onshore Wind
Reliability of generation	reliable	variable	variable
Independent of the weather	independent	dependent	dependent
Capacity factor	95%	22% - 32%	35% - 44%
Load following capability	yes	no	no
Provides frequency control	yes	no	no
Provides system inertia	yes	no	no
Black start capability	yes	no	no
Direct process heat for industry	yes	no	no
Plant Design/Economic life years	60	25	20 - 25
Plant Technical/Operational life years	>60	30	20 - 30
Land area required hectares/TWh	2.4	1,295	7,203
Visual impact	low	medium	high
Noise impact	low	low	high
Wildlife impact	low	medium	high
Major material required t/TWh	1,190	2,516	5,976
Critical minerals required t/TWh	12	124	130
Materials – concrete t/TWh	1,058	1,216	4,466
Materials – steel t/TWh	134	938	1,447
Lifecycle emissions g/kWh	12	48	11
Storage required	None	Typical Battery 4 hrs/ PHES 12 hrs	
Cost of storage $/kW	$0	$1,629 battery/kW $2,711/kW PHES	
Additional transmission	none	>$12.7 billion	
Life waste included in cost	yes	no	no
O&M cost $/MWh	11	9.7	8.2
Fuel cost $/GJ	0.5	Free	Free
Construction time years	3	0.5	1.0

SMR parameters: NuScale (USA) 12 module 924 MW plant estimate for Australia
Wind and solar: CSIRO GenCost 2021-22 Final report July 2022, transmission AEMO 2022 ISP
Pumped Hydro Energy Storage (PHES) and battery costs – CSIRO GenCost 2021-22 Table B.7
Material requirements: Bright New World (BNW) and IEA “The Role of Critical Materials in Clean Energy Transitions”
Land use: NEI April 2022
Lifecycle emissions: WNA and IPCC
O&M = Operations & Maintenance