

Trash Capital?



Singapore

Biomass Waste Potential / year

~760 000 t

[NEA Waste Statistics 2022](#); [ASTAR "Waste-to-Value Transformation."](#)

Berlin

Biomass Waste Potential / year

~250 000 t

[Berliner Stadtreinigungsbetriebe \(BSR\) circular-economy data](#); [Zero Waste Strategy 2030 \(adopted in 2021\)](#)

San Francisco

Biomass Waste Potential / year

~400 000 t

[Recology and CalRecycle organics reports](#); [MDPI \(2022\) "Organic Waste Management in California."](#)

Trash Capital?



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Biomass Waste Potential / year

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NEA Waste Statistics [2022](#); ASTAR “Waste-to-Value Transformation.”



≈ **\$96M** / year

Berlin

Biomass Waste Potential / year

~250 000 t

Berliner Stadtreinigungsbetriebe (BSR) circular-economy data; Zero Waste Strategy 2030 (adopted in [2021](#))



≈ **\$64M** / year

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Biomass Waste Potential / year

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≈ **\$55M** / year

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≈ **\$96M** / year



≈ **\$64M** / year



≈ **\$55M** / year

Running Out of Space



Running Out of Space



Singapore

Estimated Rooftop / Facade Potential

~619 ha (~ 6.19 km²)

[Mapping utilizable rooftop areas to meet food security goal in four high-density cities: A deep learning and GIS integrated approach](#)



Berlin

Estimated Rooftop / Facade Potential

~888.7 ha (~ 8.887 km²)

[Potential of Urban Rooftop Farming in Berlin \(Dannehl et al.\)](#)



San Francisco

Estimated Rooftop / Facade Potential

~3600 ha (~ 36 km²)

[San Francisco Planning Department – Better Roofs Program; Living Roof Cost-Benefit Study \(2016\)](#)

Running Out of Space - Surrounded by Space



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Estimated Rooftop / Facade Potential

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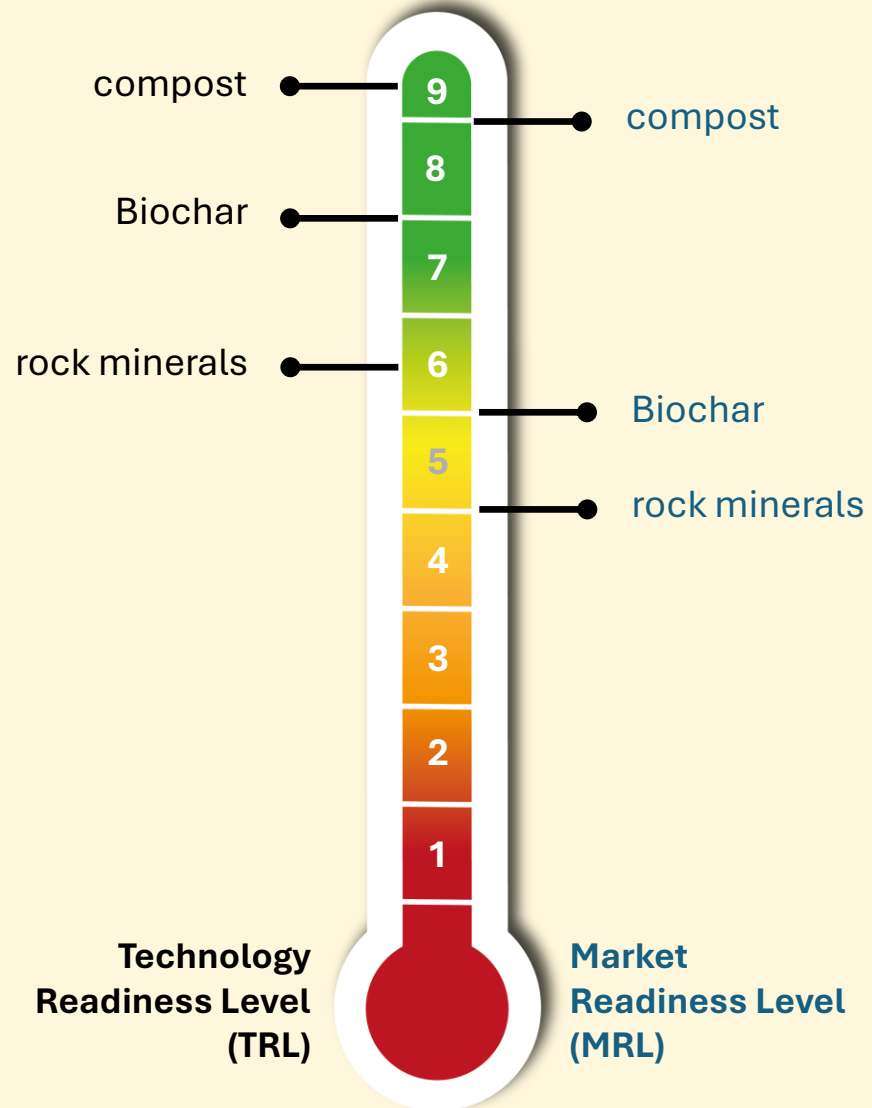
San Francisco

Estimated Rooftop / Facade Potential

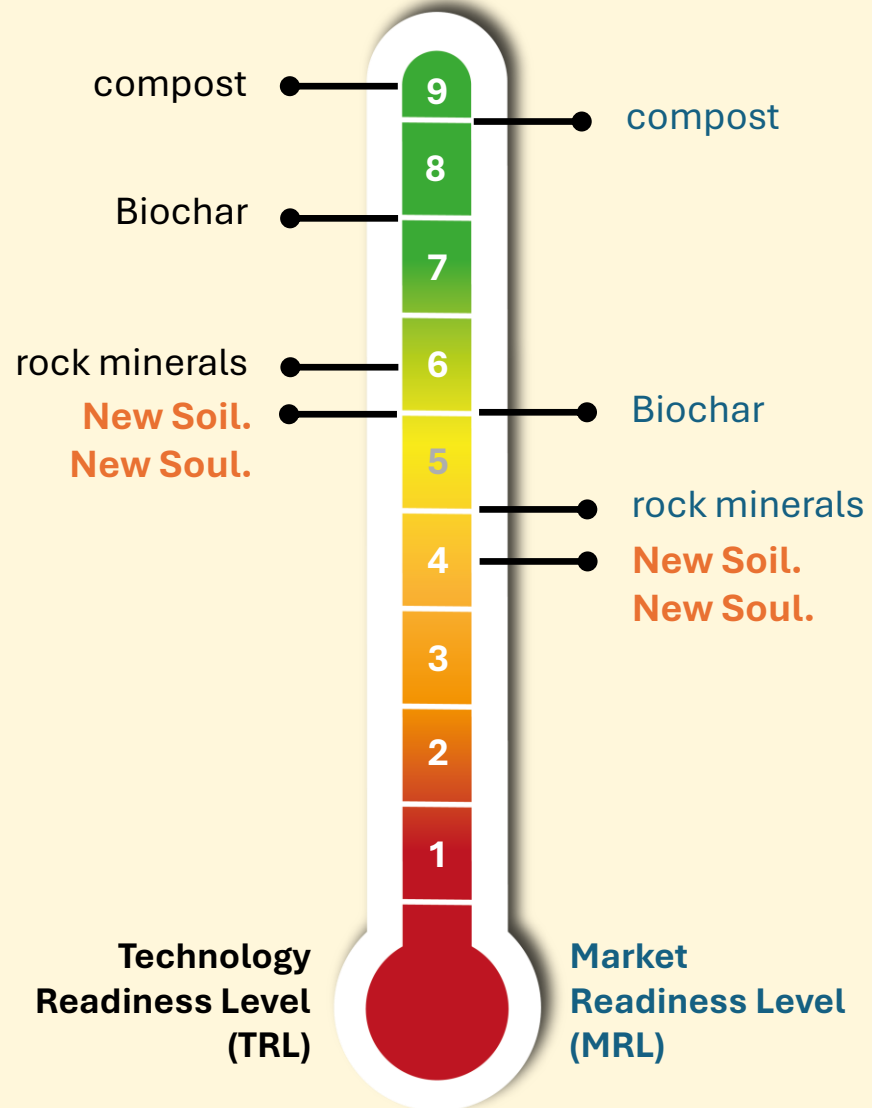
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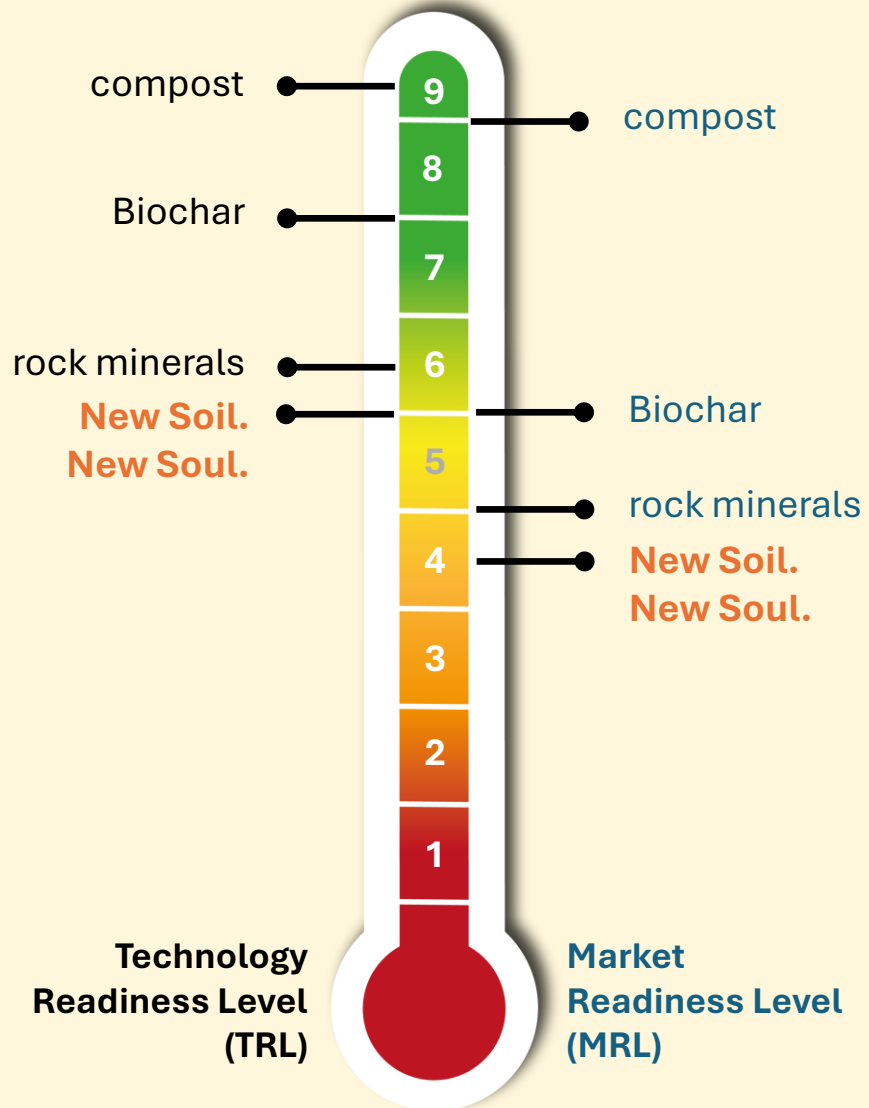
New Soil. New Soul.



New Soil. New Soul.

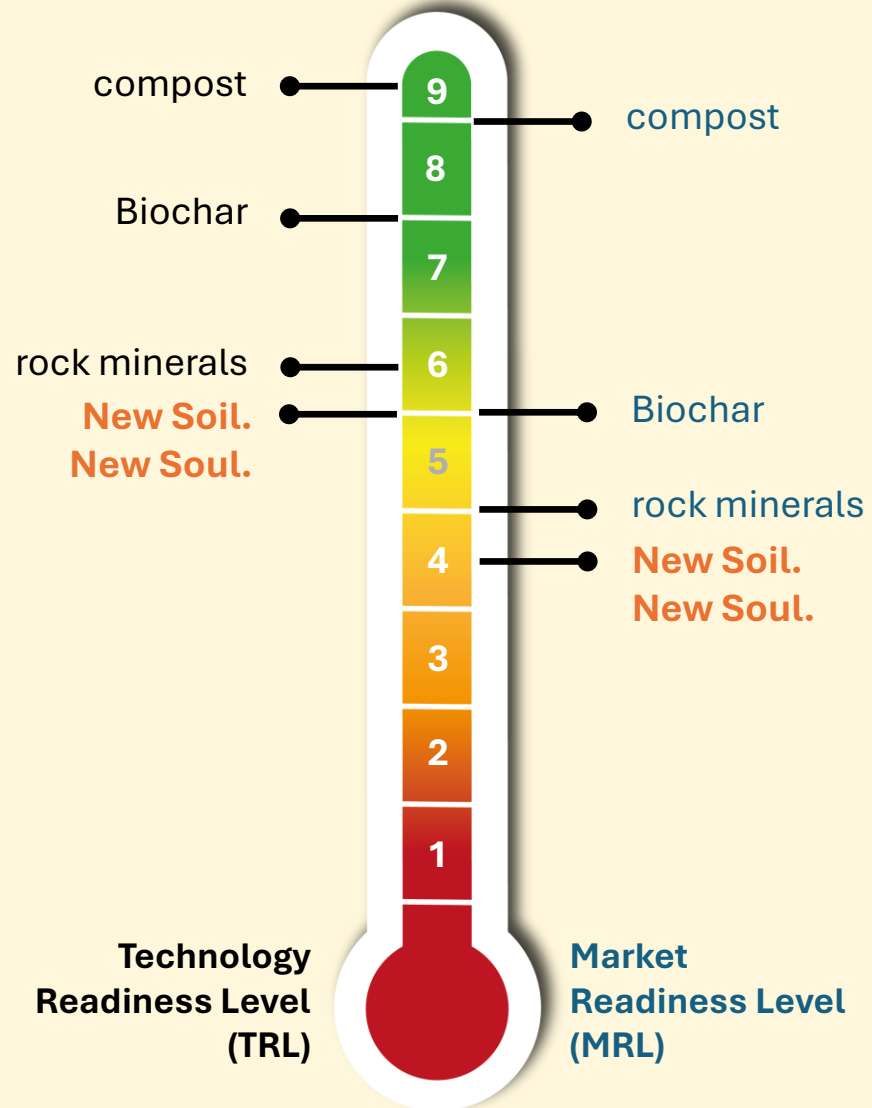


New Soil. New Soul.



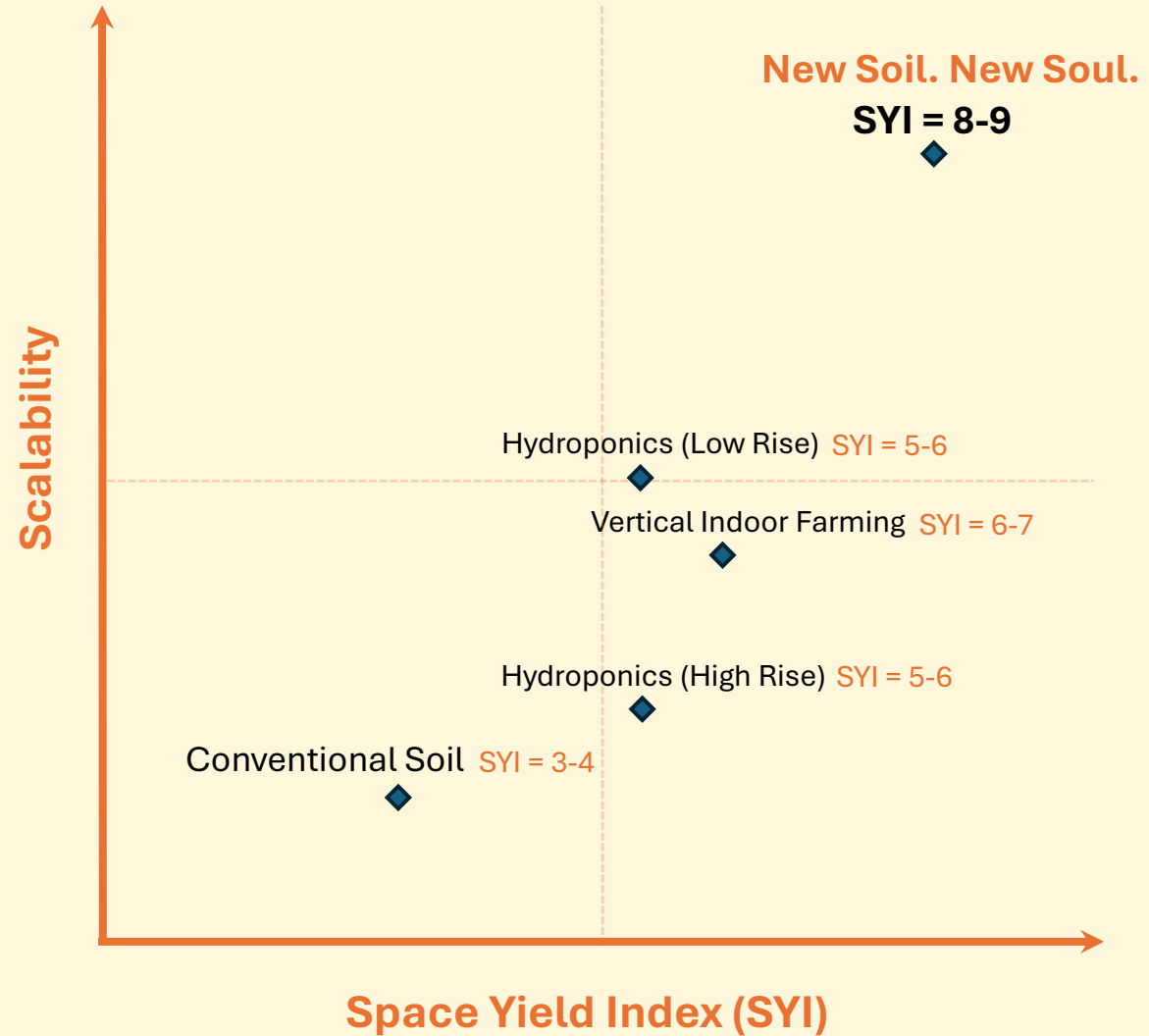
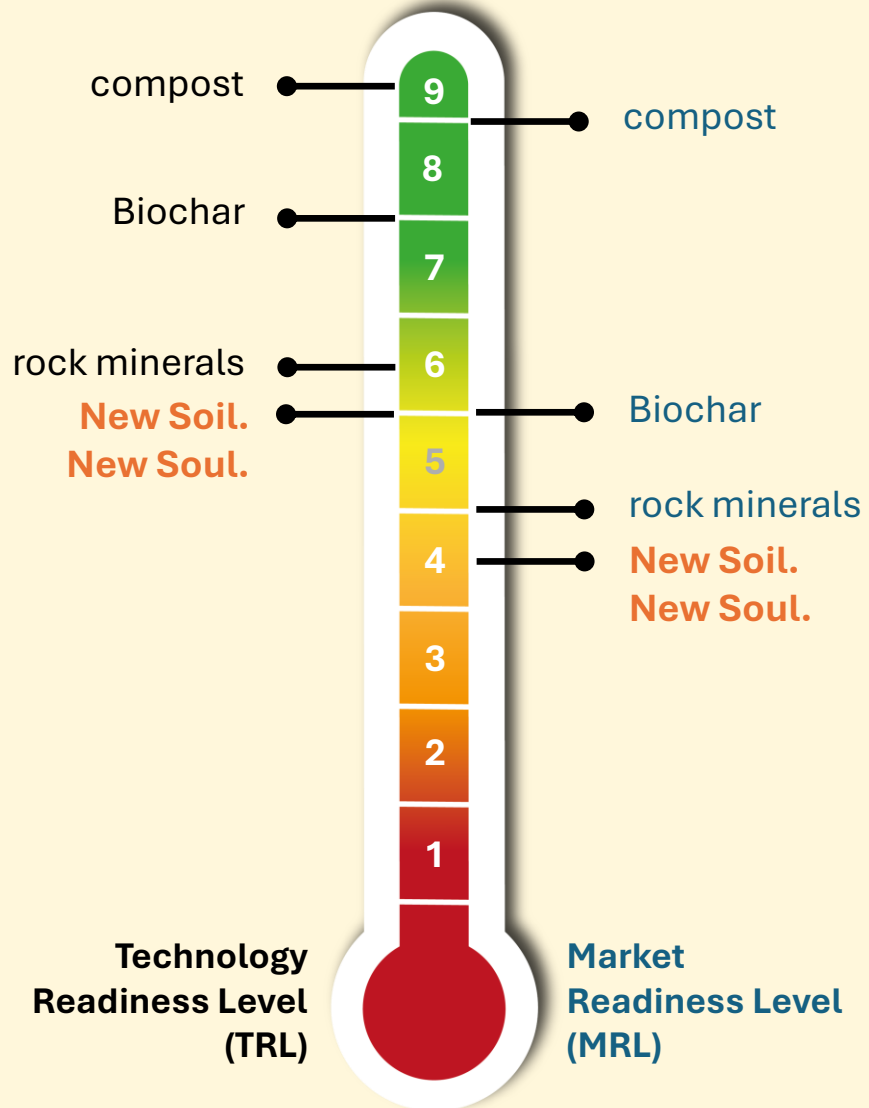
Parameter	Conventional Soil (field / topsoil)
Bulk Density (t / m ³)	≈ 1.3 – 1.5 (typical loam)
Weight of 1 m³ (kg)	≈ 1500
Organic Matter Content (%)	3-5
Σ Nutrient Content (N + P₂O₅ + K₂O) (% w/w)	≈ 2 – 3
Water-holding Capacity (% (v/v))	25–35
Cation Exchange Capacity (CEC) (cmol(+)/kg)	10–15

New Soil. New Soul.



Parameter	Conventional Soil (field / topsoil)	New Soil. New Soul.	Change
Bulk Density (t / m ³)	≈ 1.3 – 1.5 (typical loam)	≈ 0.30 – 0.35	≈ 75 % lighter
Weight of 1 m³ (kg)	≈ 1500	≈ 375	↓ by ~ 1125
Organic Matter Content (%)	3-5	20-25	↑ ≈ 5×
Σ Nutrient Content (N + P ₂ O ₅ + K ₂ O) (% w/w)	≈ 2 – 3	≈ 8 – 12	≈ 4× richer
Water-holding Capacity (% (v/v))	25–35	60–70	↑ ≈ 2×
Cation Exchange Capacity (CEC) (cmol(+)/kg)	10–15	40–60	↑ ≈ 4×

New Soil. New Soul.



New Soil. New Soul.



Singapore 30-by-30

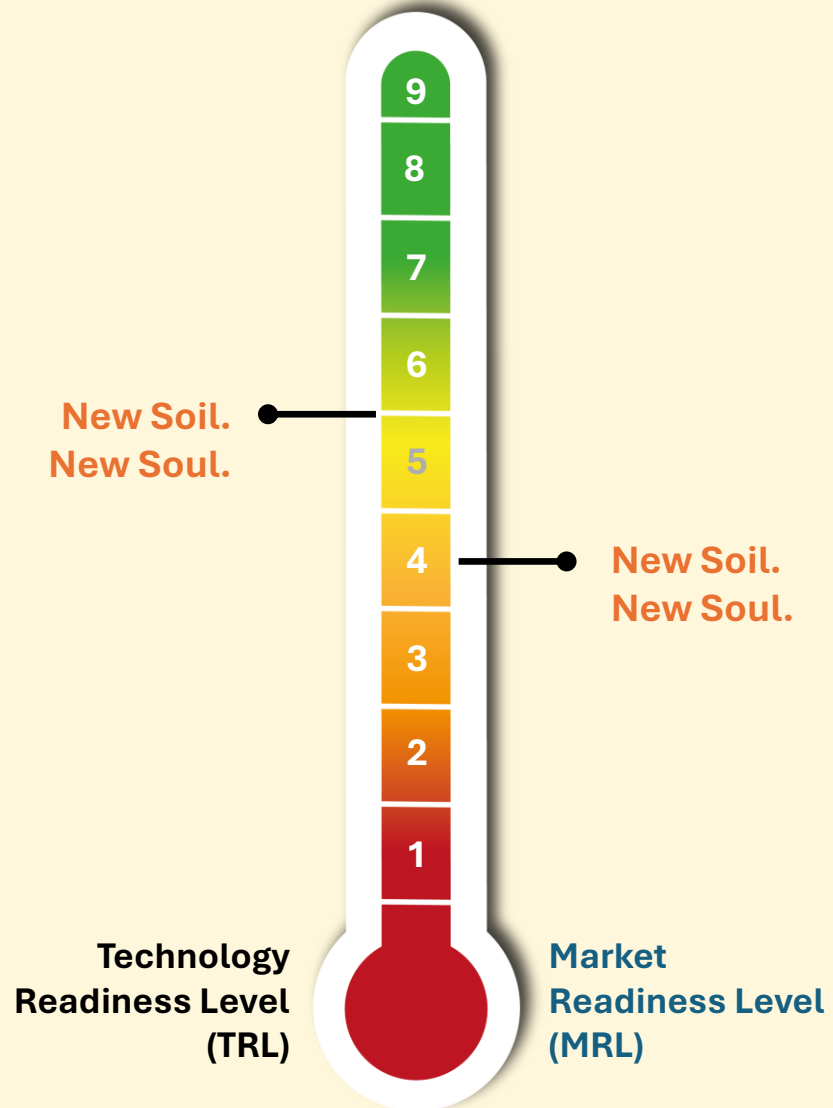


EU Soil Strategy for 2030

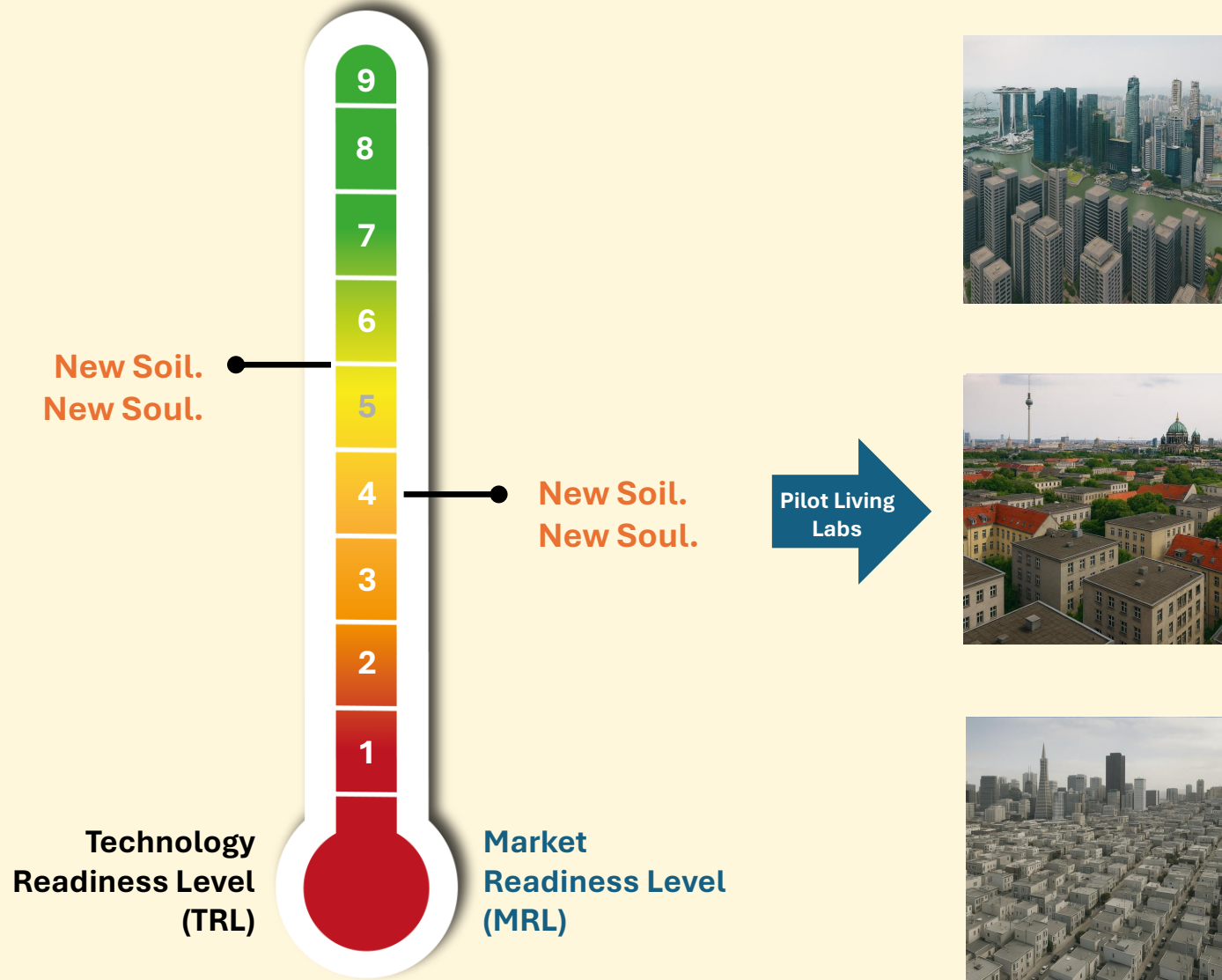


**San Francisco's Circular
Economy Framework**

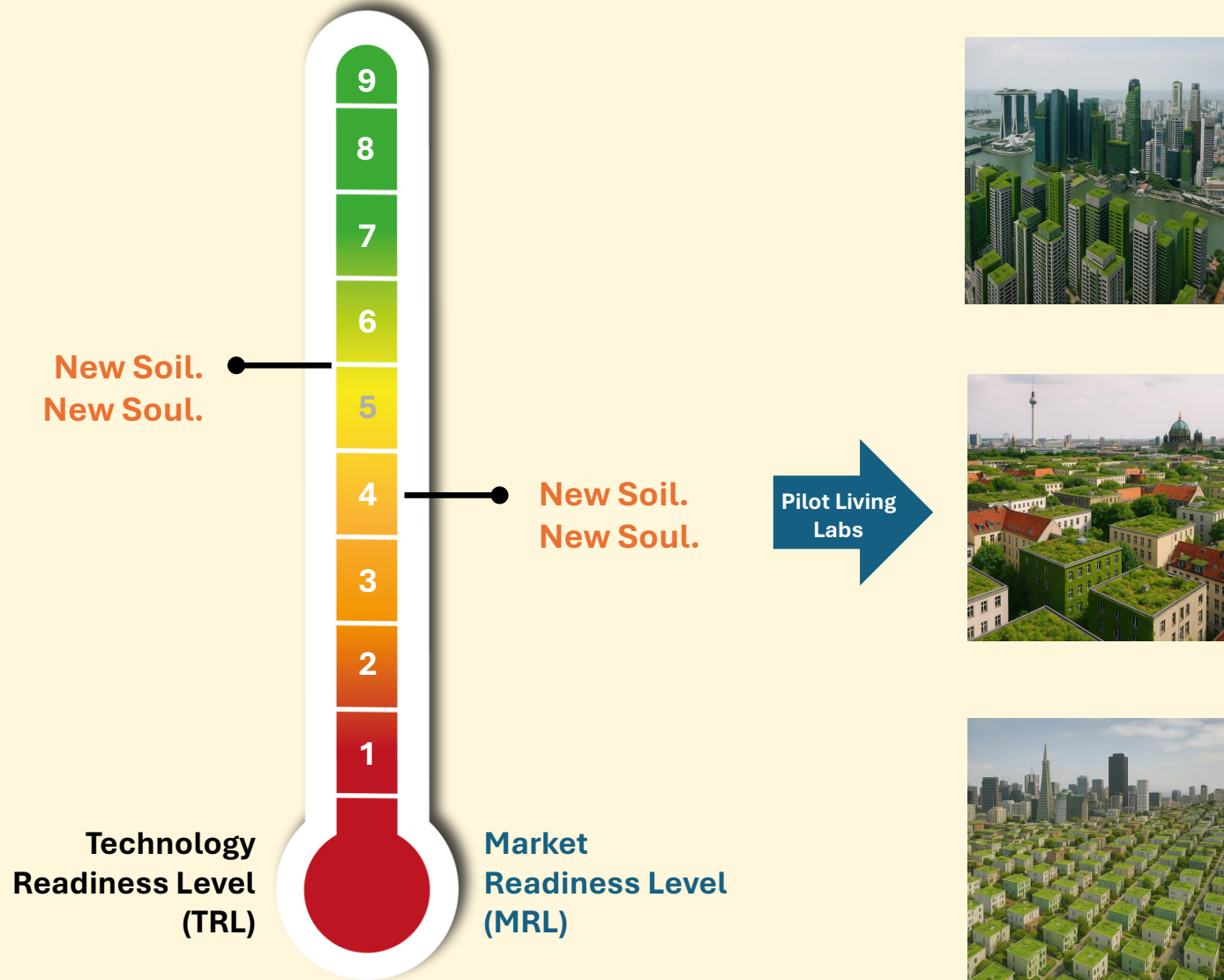
New Soil. New Soul.



New Soil. New Soul.



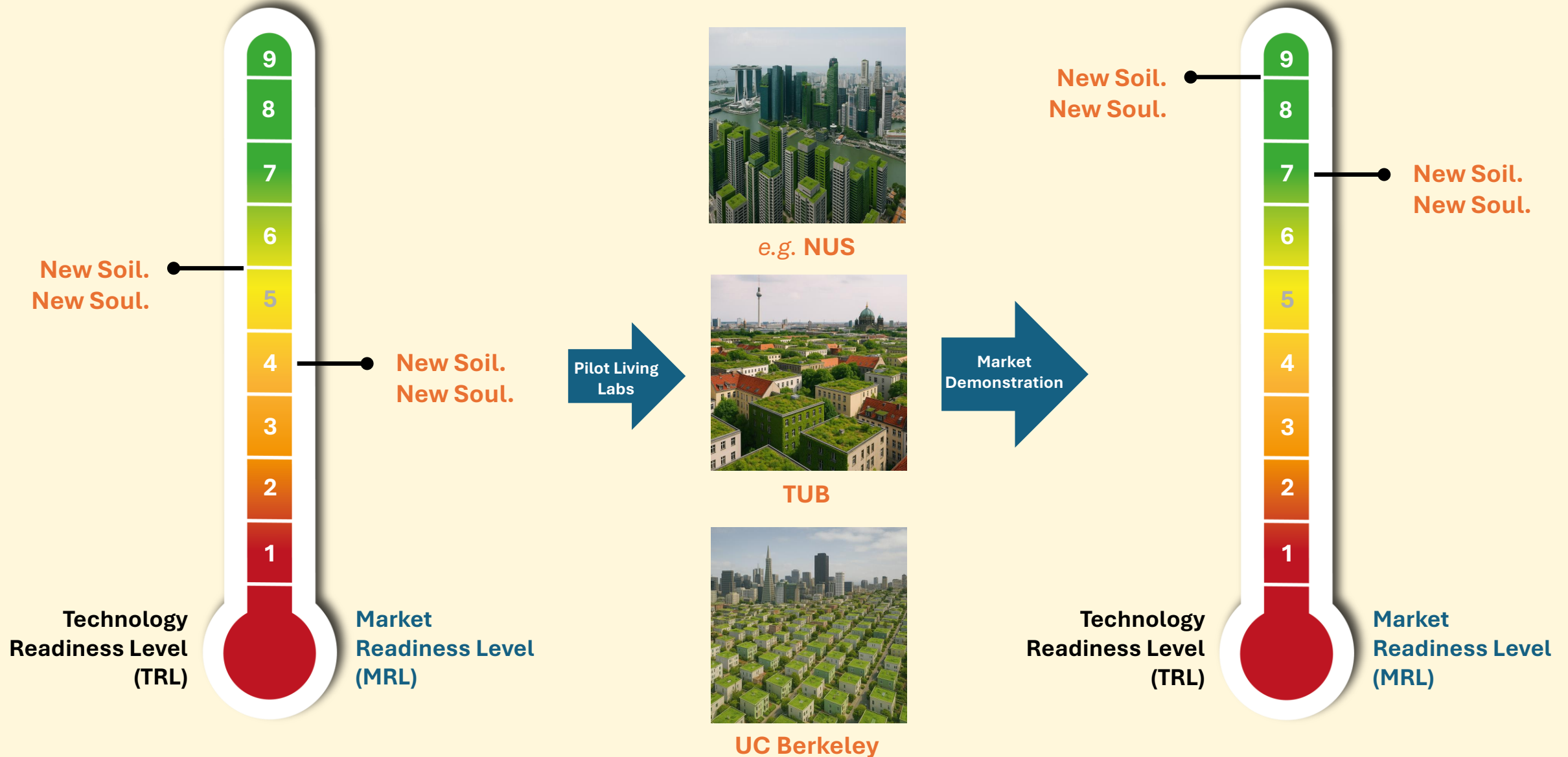
New Soil. New Soul.



New Soil. New Soul.



New Soil. New Soul.



NEW SOIL. NEW SOUL.