



SWIPP

INVESTIGATION INTO POTENTIAL WASTE
MANAGEMENT INFRASTRUCTURE SCENARIOS

Strategic Waste Infrastructure Planning Project (SWIPP):

- WAWA and DEC initiative
- Plan future waste infrastructure needs for Perth metro & Peel regions
- Identify sustainable & cost-effective SWM infrastructure sites for the next 40 years

	Population (m)	Waste (mT/year)
2011	1.85	5.8
2026	2.44	7.7

- Waste diversion targets 2019/2020
- Current diversion – 34.5%



MSW Metro – 65%
MSW Non-Metro – 50%
C&I – 70%
C&D – 75%

- Hyder 2011 Recycling Activity Report + DEC landfill data.

- Investigate possible waste management infrastructure approaches
 - Cope with future waste generation in the region
 - Meet current targets
- Develop a modeling tool to identify infrastructure needs over the next 40 years (from a 2011 baseline) until 2050.
 - Analyze and compare the effectiveness of different technology combinations to determine which infrastructure scenarios can meet the Waste Strategy diversion targets for the Perth metro & Peel regions.
- Evaluate performance against targets under current strategy and proposed infrastructure
- Need to consider:
 - Changes in population, economy and levels of source separation
 - Lifespans and capacities of infrastructure

- Development of the modelling tool
- Consultation with key stakeholders
 - Regional council organisations
 - Existing facility operators
 - Current proponents of new regional waste management infrastructure
 - Able to inform modelling parameters such as current flows of urban waste, facility annual and lifetime capacity limits, recovery efficiencies and estimated lead times for new facility development
- Compilation of waste flow baseline data
- Analysis of 12 scenario combinations agreed with DEC
- Sensitivity analysis around key variables agreed with DEC
- Scenario comparison

MSW

A1: Business-as-Usual

A2: Alternative Waste Treatment

A3: Dirty MRF with Energy from Waste

A4: Dirty MRF with Anaerobic Digestion

A5: Source Separation with Composting

C&I

B1: Business-as-Usual

B2: Alternative Waste Treatment

B3: Dirty MRF with Energy from Waste

B4: Dirty MRF with Anaerobic Digestion

B5: Source Separation with Composting

C&D

C1: Business-as-Usual

C2: Mixed Waste

C3: Source Separated Waste

C4: Mixed Waste with Energy from Waste

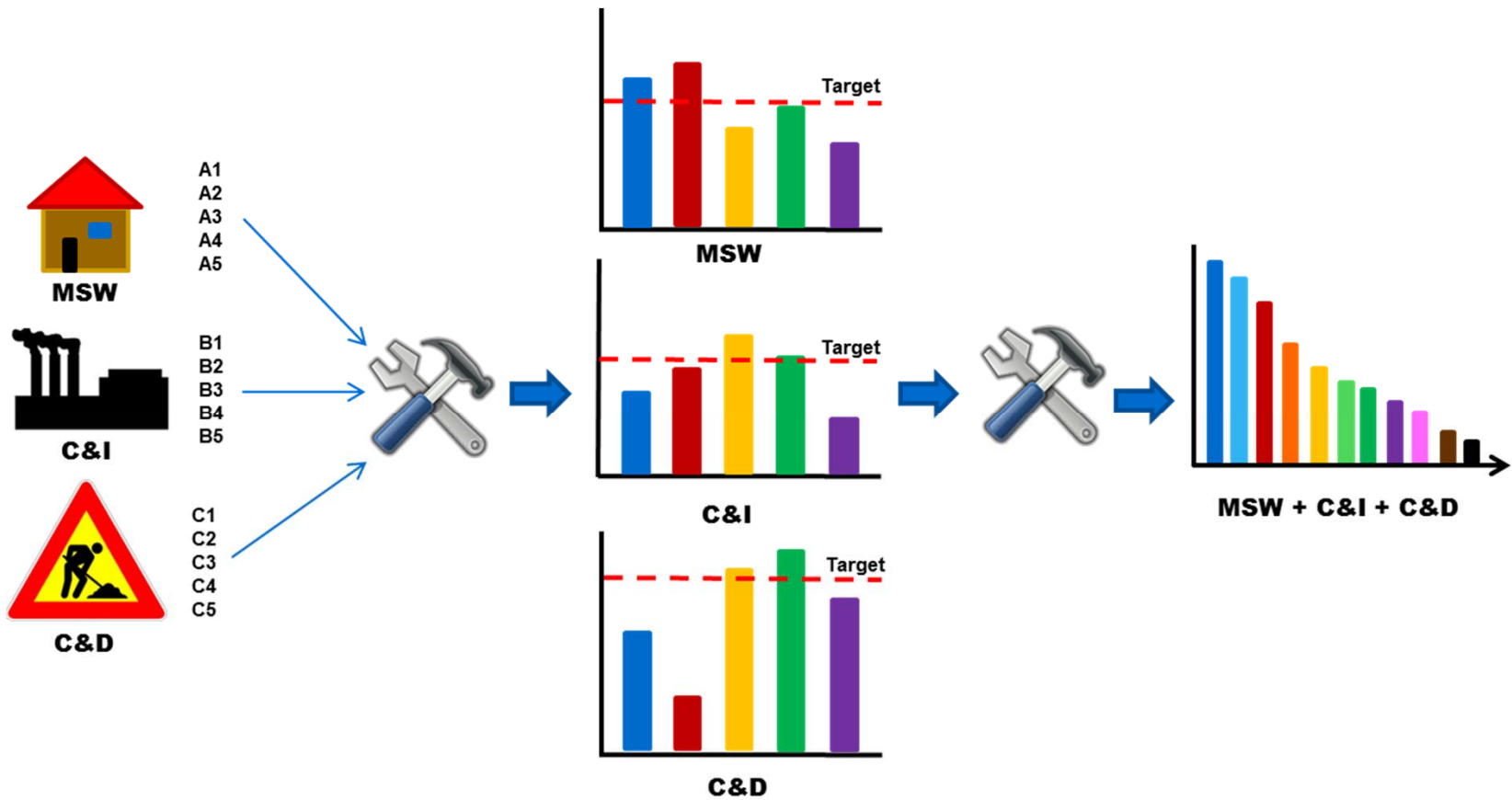
C5: Source Separated Waste with Energy from Waste

MODELLING SCENARIOS



Scenario	MSW	C&I	C&D
S1	A1: BAU	B1: BAU	C1: BAU
S2	A2: AWT	B1: BAU	C1: BAU
S3	A2: AWT	B1: BAU	C2: Mixed
S4	A2: AWT	B1: BAU	C3: SS
S5	A2: AWT	B2: AWT	C1: BAU
S6	A2: AWT	B2: AWT	C2: Mixed
S6B	A2: AWT-B	B2: AWT-B	C2: Mixed
S7	A2: AWT	B5: SS + Compost	C2: Mixed
S8	A3: EfW	B3: EfW	C2: Mixed
S8B	A3: EfW-B	B3: EfW-B	C2: Mixed
S9	A3: EfW	B3: EfW	C4: Mixed + EfW
S10	A3: EfW	B3: EfW	C5: SS + EfW
S11	A4: AD	B4: AD	C2: Mixed
S11B	A4: AD-B	B4: AD-B	C2: Mixed
S12	A5: SS + Compost	B5: SS + Compost	C5: SS

MODELLING SCENARIOS



DEMONSTRATION

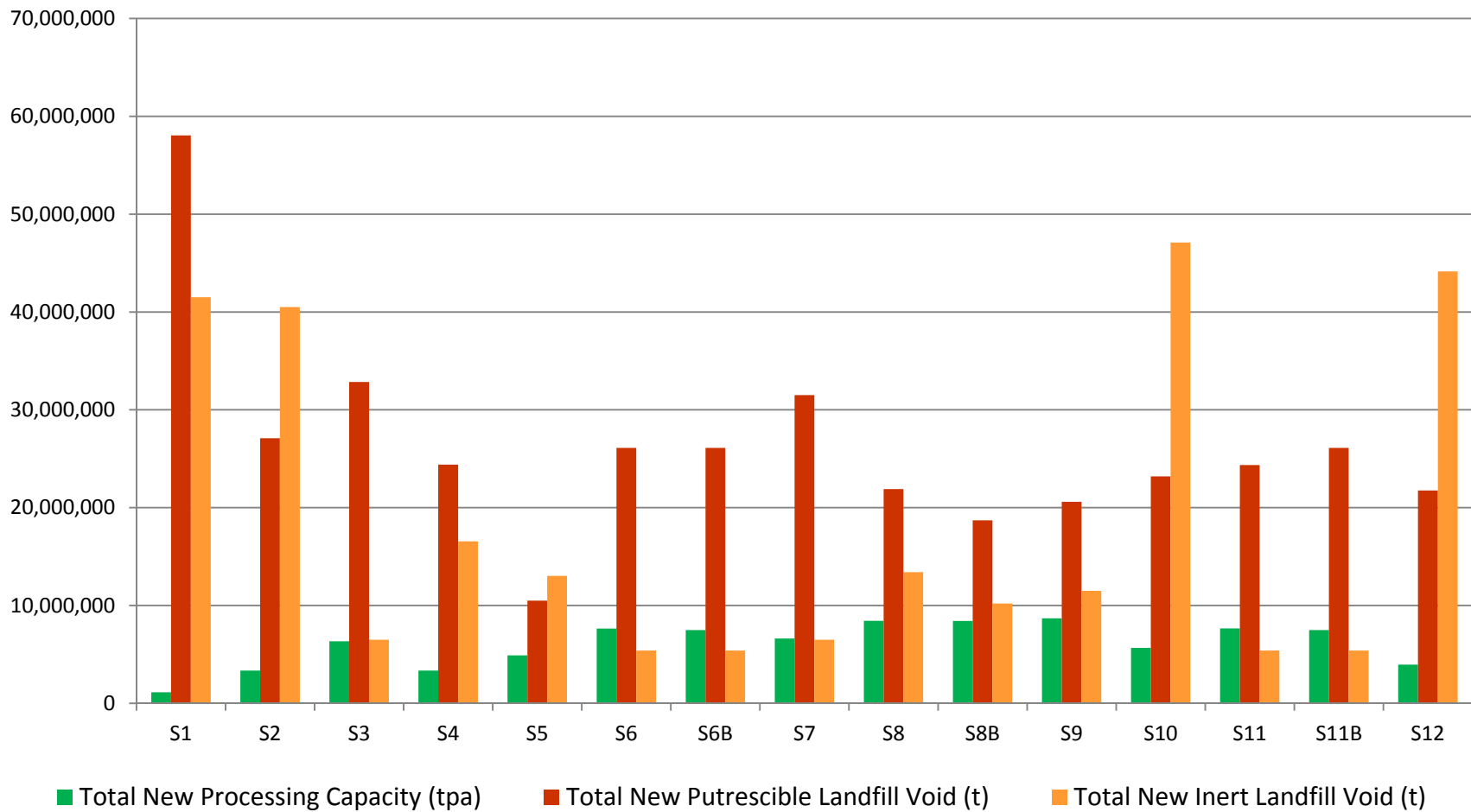
MOST EFFECTIVE SCENARIOS

- Scenarios 8, 9 and 8B
 - New thermal EfW facilities to process residual MSW and C&I waste
 - New mixed C&D recyclers and processing
 - With / without processing of C&D waste through EfW facilities
 - With / without maintenance of existing source separation levels for MSW and C&I

RESULTS



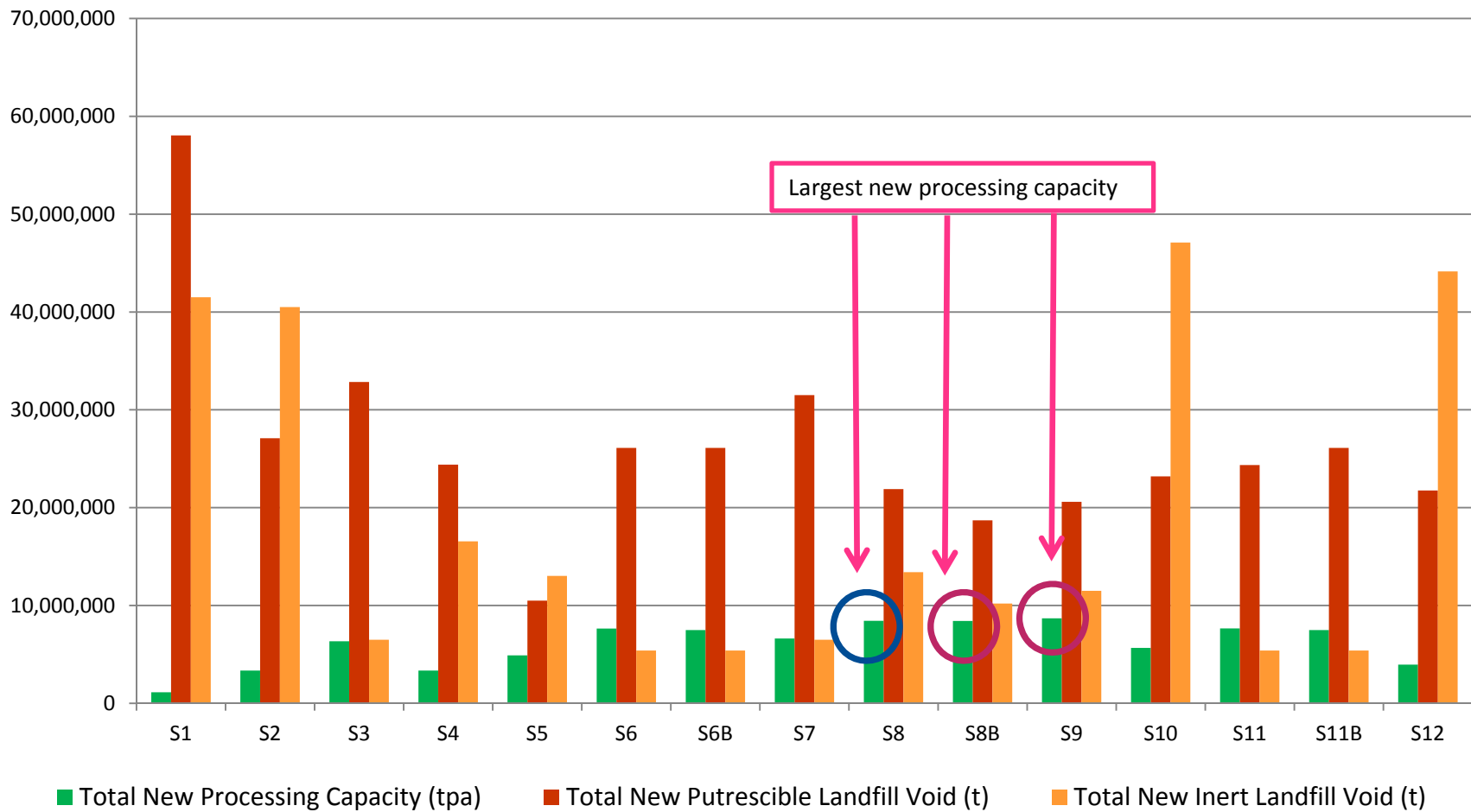
New Facility Capacity Required (between 2012 to 2050)



RESULTS



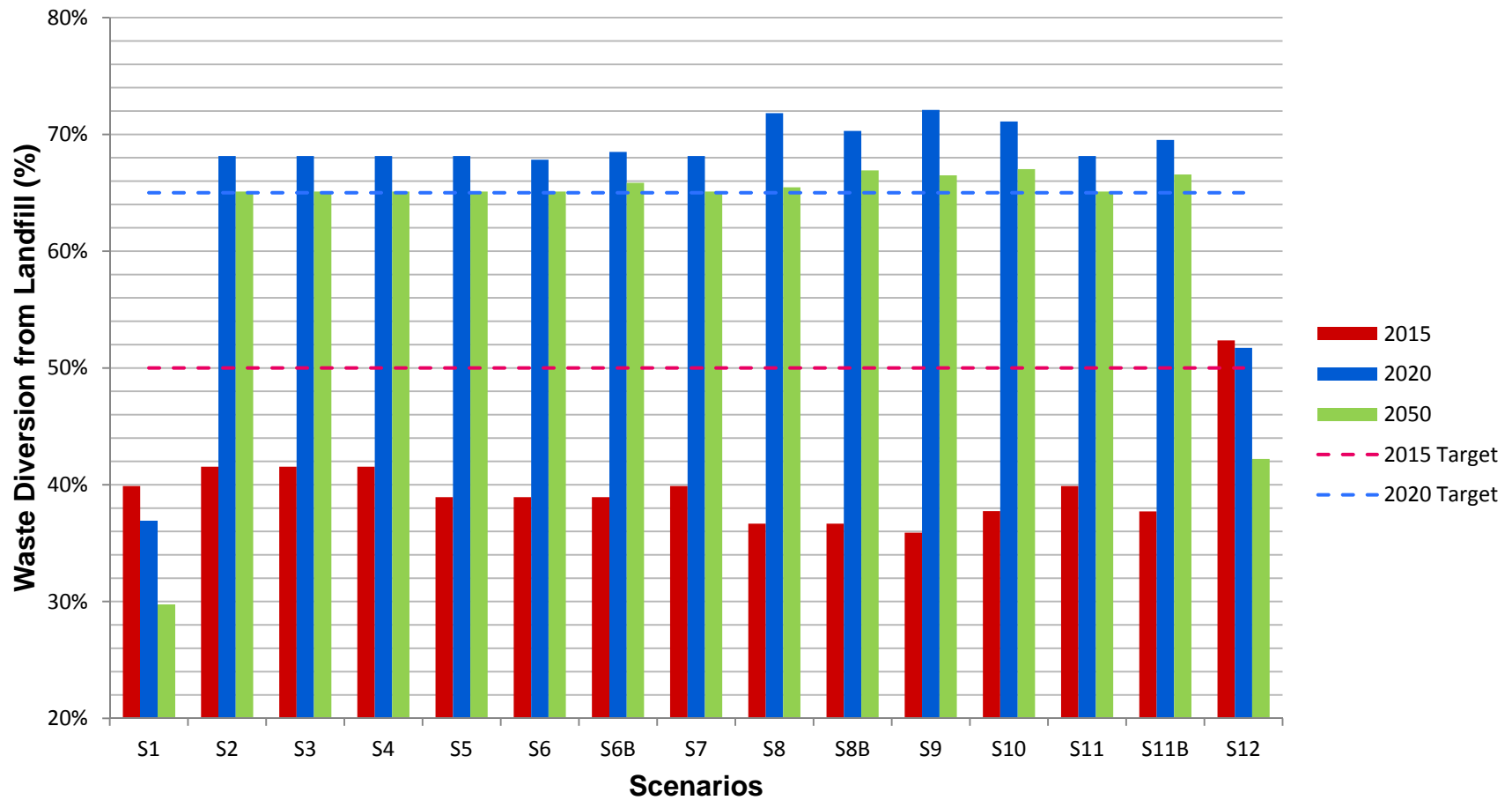
New Facility Capacity Required (between 2012 to 2050)



RESULTS



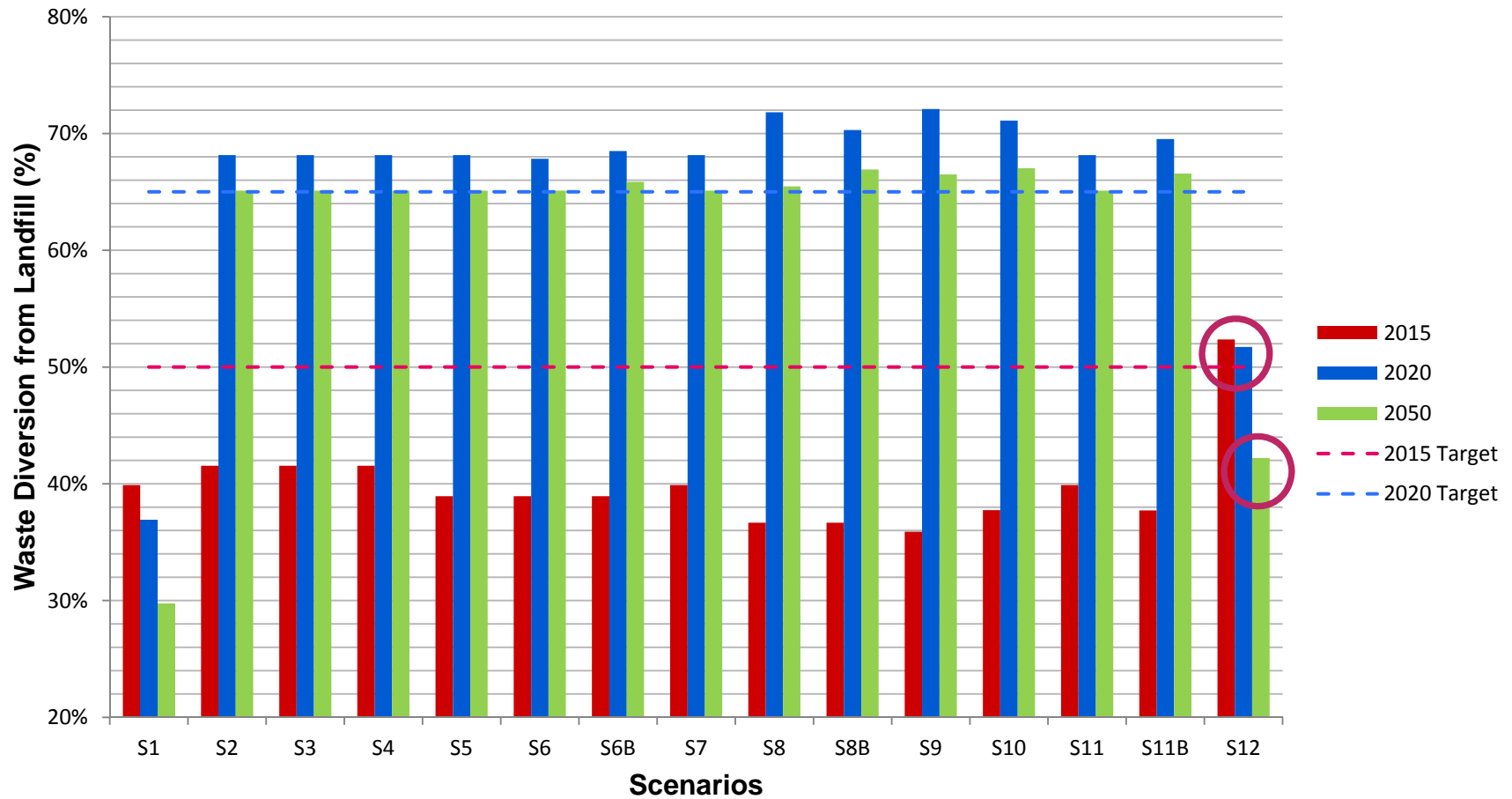
Diversion Performance - MSW Metro



RESULTS



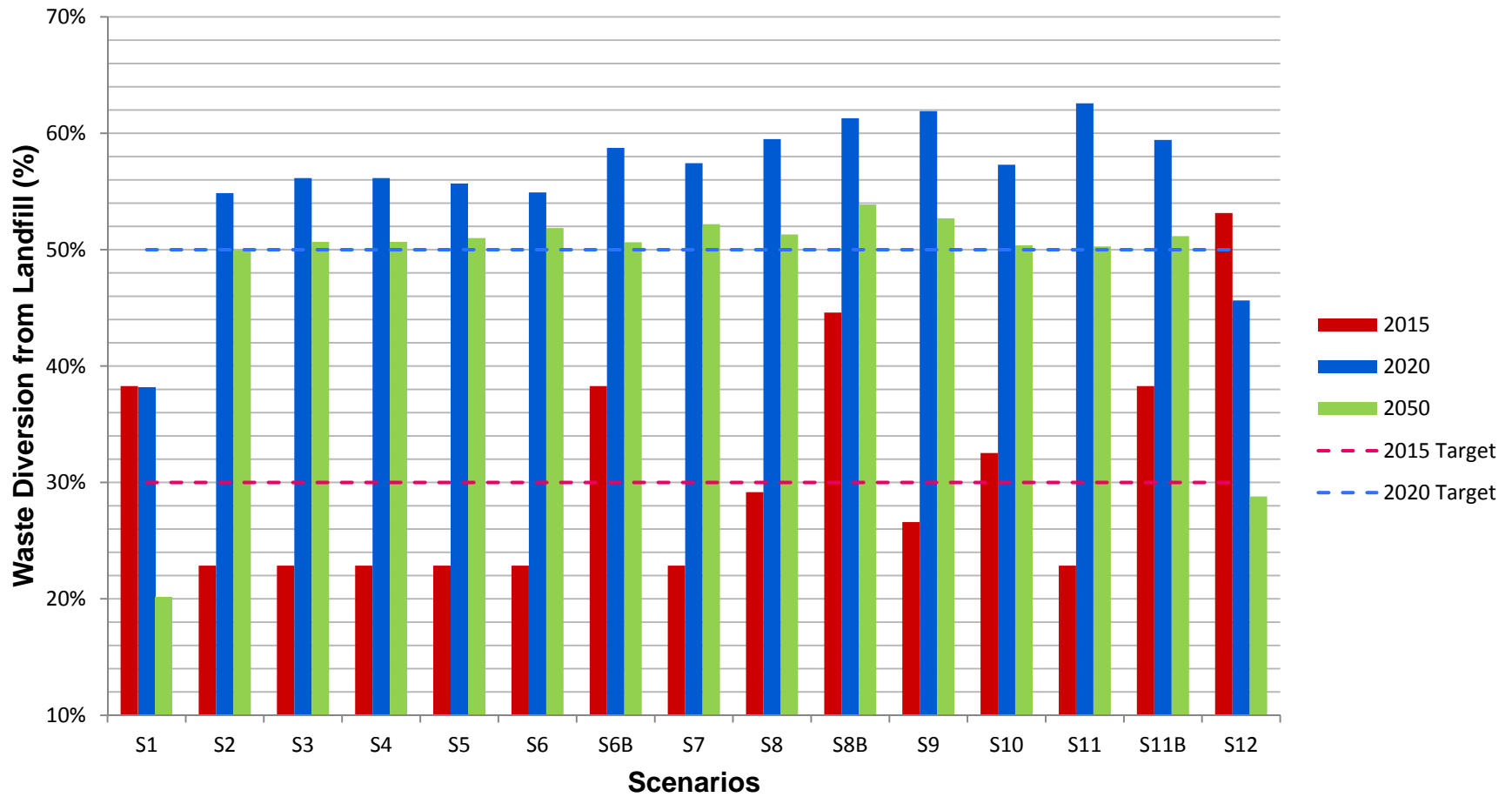
Diversion Performance - MSW Metro



RESULTS



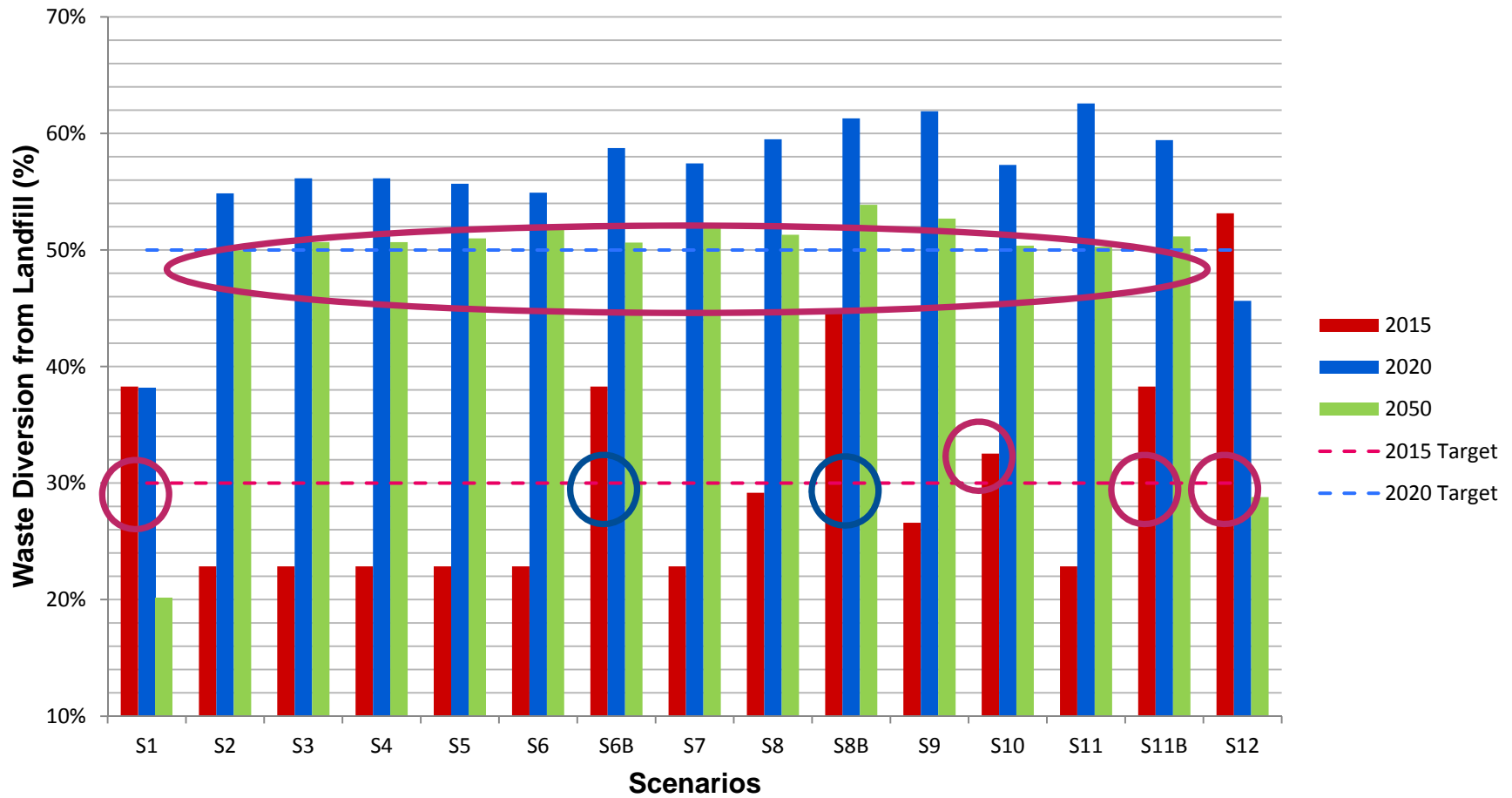
Diversion Performance - MSW Peel



RESULTS



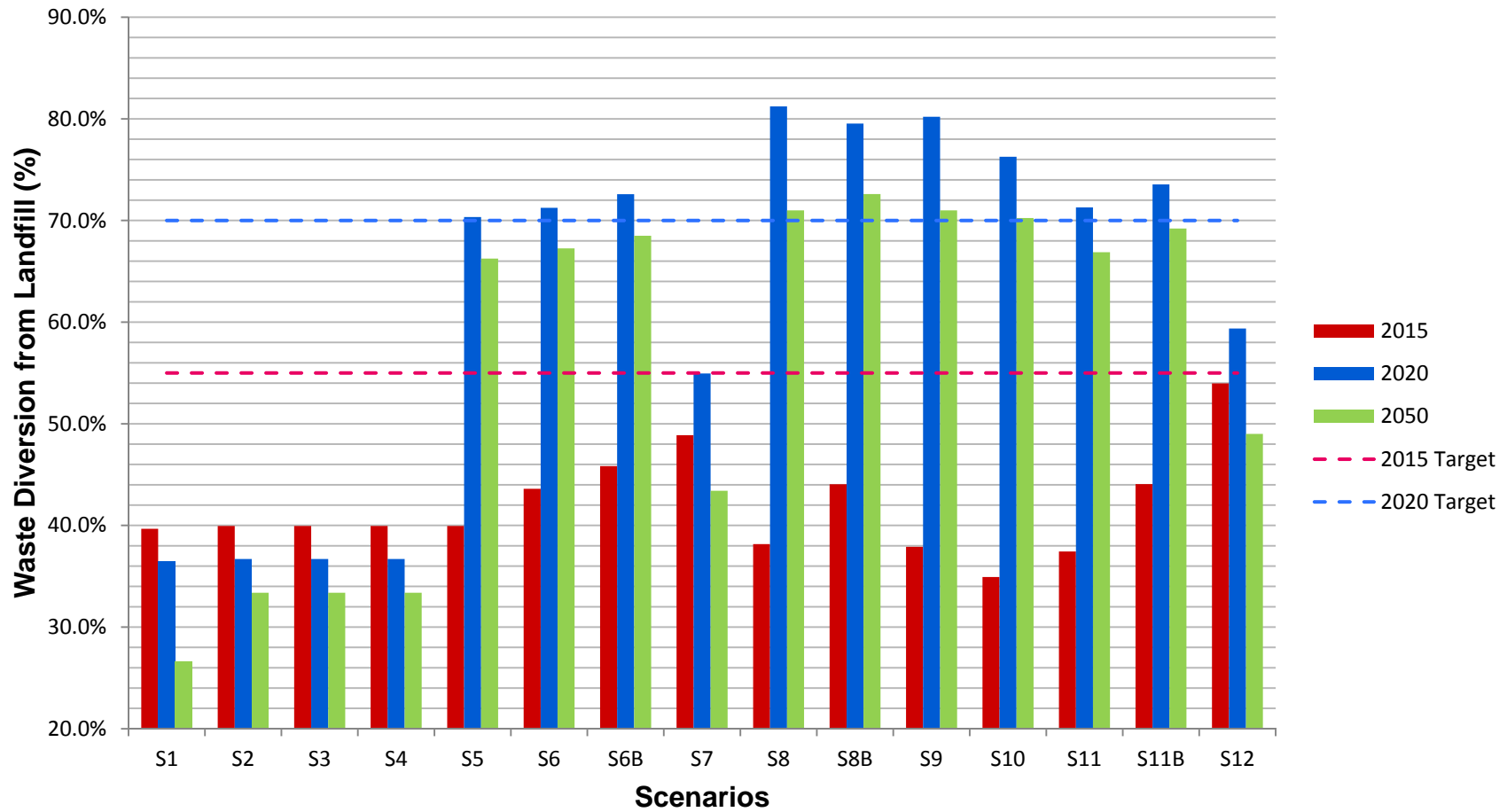
Diversion Performance - MSW Peel



RESULTS



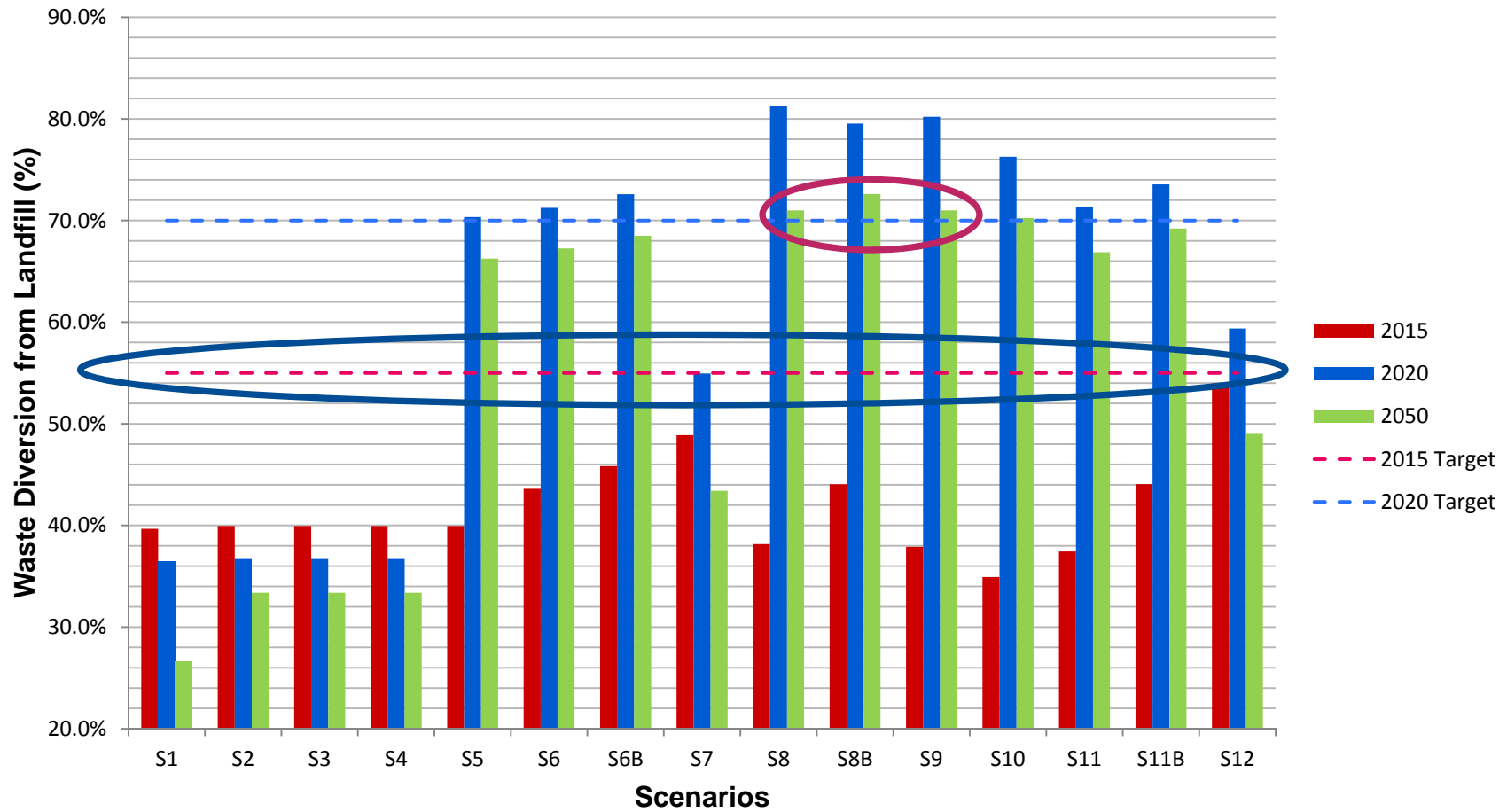
Diversion Performance - C&I



RESULTS



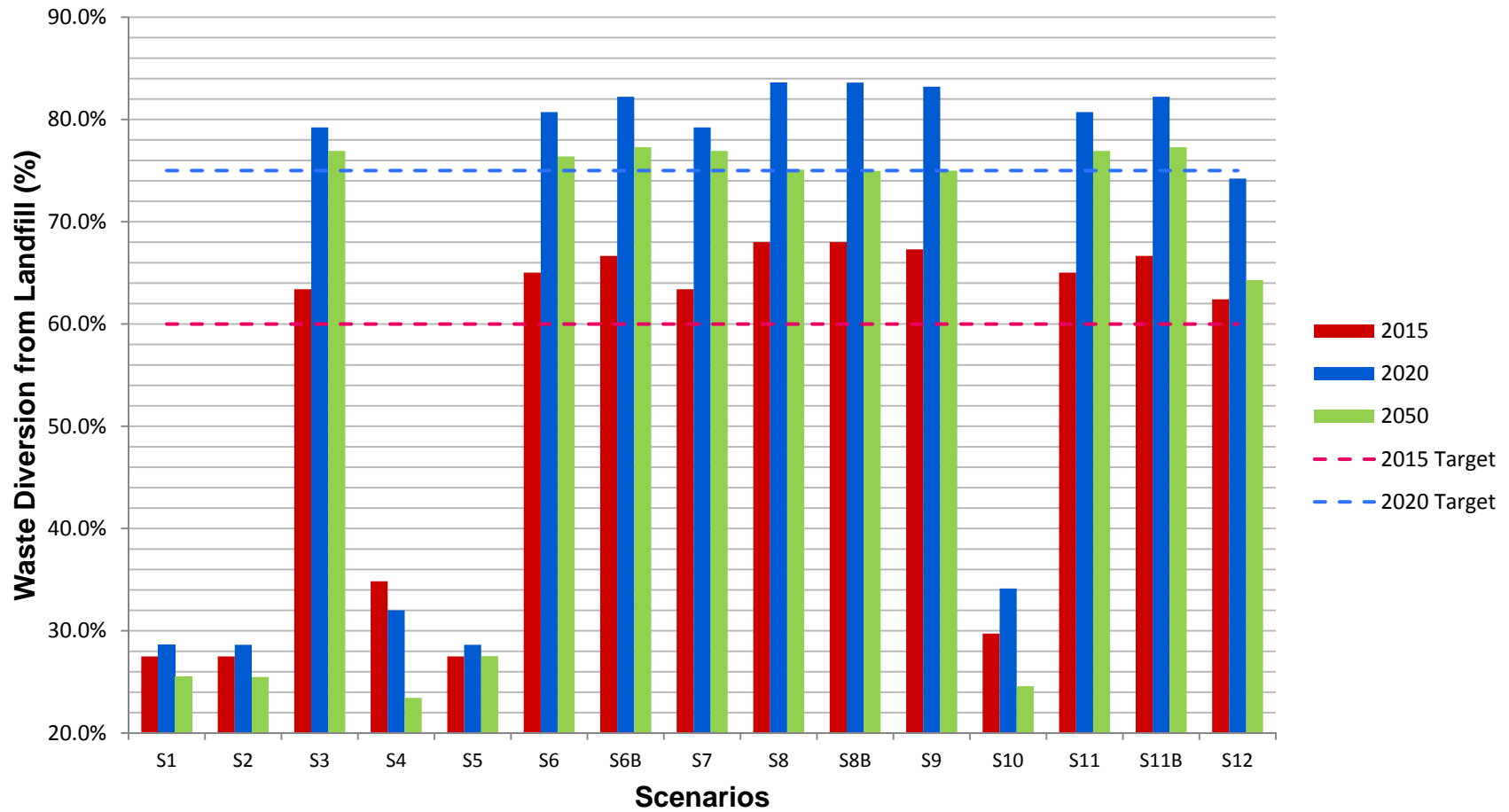
Diversion Performance - C&I



RESULTS



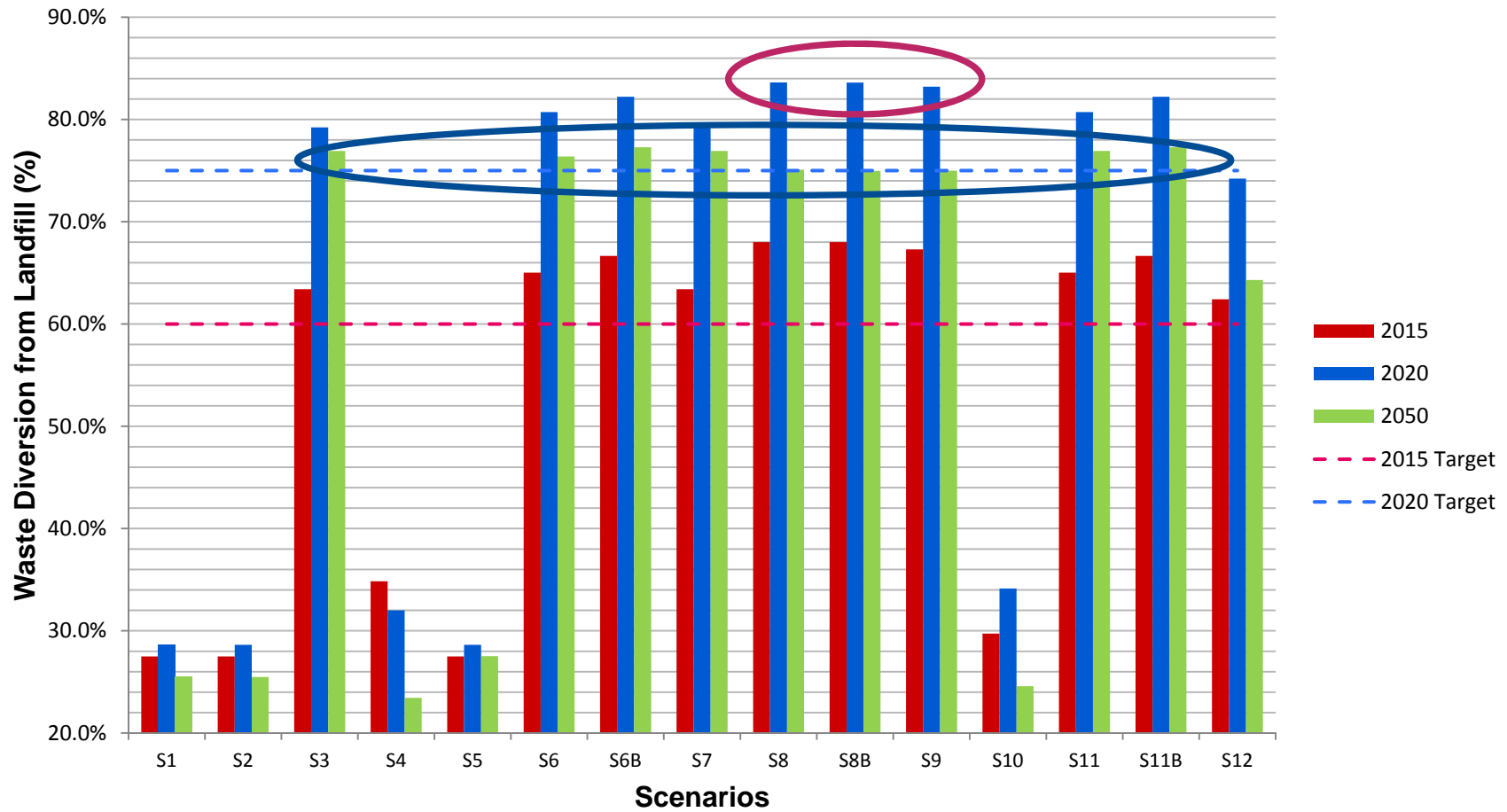
Diversion Performance - C&D



RESULTS



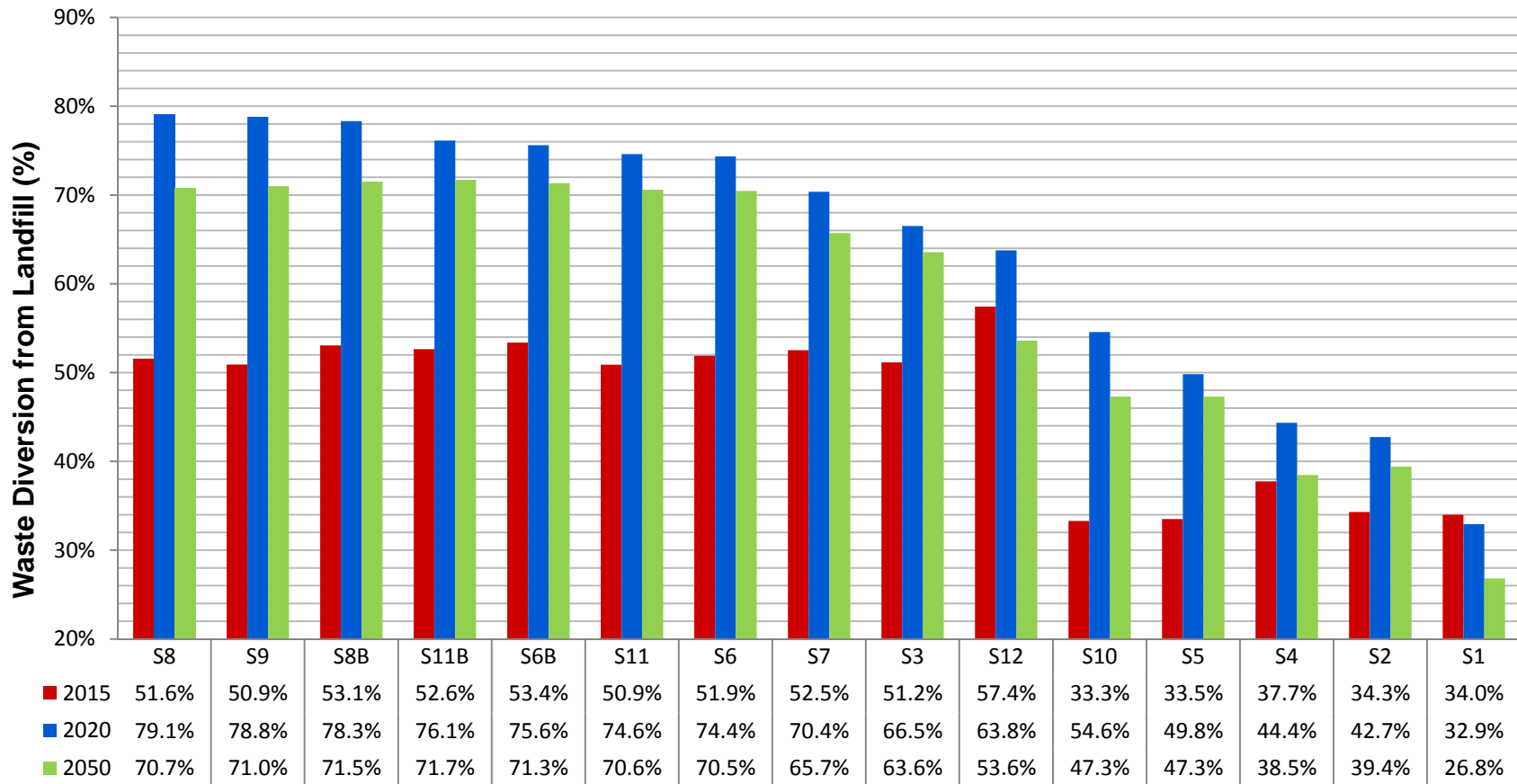
Diversion Performance - C&D



RESULTS



Overall Diversion Performance



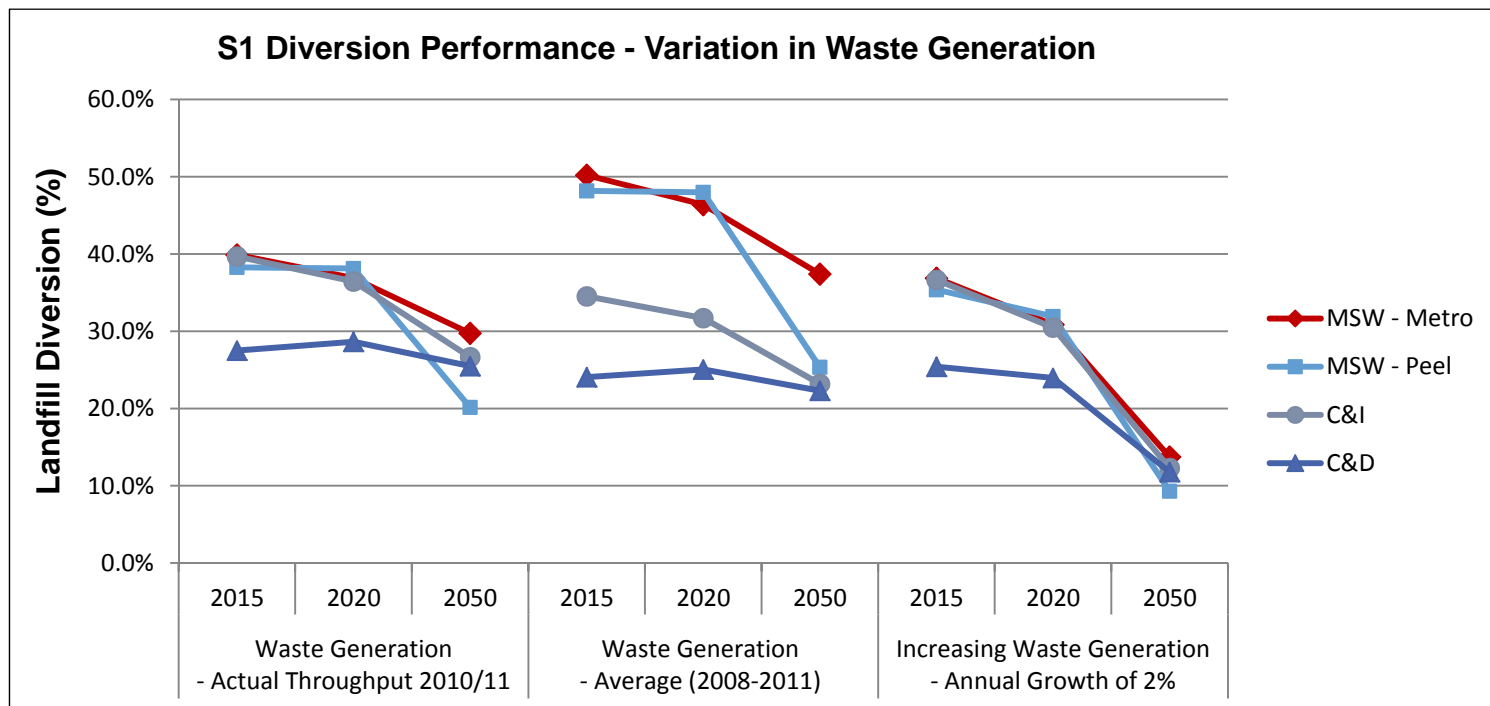
Scenarios Analysed

- Sensitivity analyses were conducted around the following parameters:
 - Population growth over the modelling period
 - Baseline waste generation rate and growth in per capita waste generation
 - Potential future increases in waste diversion targets
 - Recovery efficiency rates of new AWT / Dirty MRF, EfW, AD and C&D facilities
 - Material capture rates through source separation
- Variations due to: facility technologies selected, scale of facilities, complexity of processing, extent of education programs and technological developments that influence changes in consumption patterns and packaging design.

MODELLING SENSITIVITY ANALYSIS - EXAMPLE



- Used for report:
 - Waste throughput in 2010/11 then pegged to population increase
- Alternate scenarios:
 - Averaged waste generation per capita over the past 4 years
 - Additional 2% annual waste generation growth in response to economic growth



- Business-as-usual will not achieve targets
- Source separation strategies unlikely to achieve targets
- AWTs could achieve 2020 targets for MSW and C&I
- EfW + Dirty MRFs could easily achieve 2020 targets
- Mixed processing for C&D could easily achieve 2020 / 2050 targets

- Ensure that current market-driven approach is not relied upon
- Strengthen policy frameworks – AWT, EfW, Dirty MRF, mixed C&D

- Future actions:
 - Analysis of available land sites
 - Logistics modelling for suitable sites
 - Re-apply the Hyder modelling tool for these sites
 - Cost Benefit Analysis of preferred infrastructure combinations
 - Address barriers to investment and planning approval