

Table ES-1. Summary of Profiled Emerging Energy-Efficient Industrial Technologies

Technology	Sector	Total ¹ Energy Savings	Sector ² Savings	Simple Payback	Environ. Benefits	Other ³ Benefits	Suggested Next Steps	Likelihood of Success
Advanced forming	Aluminum	Medium	Medium	Immediate	None	P	R&D	High
Efficient cell retrofit designs	Aluminum	High	High	2.7	Somewhat	P	Demo	High
Improved recycling technologies	Aluminum	Medium	Medium	4.5	Significant	P	Demo	Medium
Inert anodes/wetted cathodes	Aluminum	High	High	4.0	Significant	P, Q	R&D	Medium
Roller kiln	Ceramics	Medium	High	1.9	Significant	P	Demo	Medium
Clean fractionation—cellulose pulp	Chemicals	Low	Low	1.9	Significant	P, O	Demo	Medium
Gas membrane technologies—chem.	Chemicals	Low	Low	10.2	Significant	Q, O	Dissem.	High
Heat recovery technologies—chem.	Chemicals	Medium	Medium	2.4	None	P, O	Dissem., Demo	Medium
Levulinic acid from biomass	Chemicals	Low	Low	1.5	Significant	P, O	Demo	High
Liquid membrane technologies—chem.	Chemicals	Low	Low	11.2	Significant	O	Dissem.	Medium
New catalysts	Chemicals	Medium	Medium	7.9	Somewhat		R&D	Medium
Autothermal reforming—ammonia	Chemicals	High	High	3.7	Significant	P	Dissem	Medium
Plastics recovery	Plastics	Medium	Medium	2.8	Compelling	P	Demo	High
Continuous melt silicon crystal growth	Electronics	Medium	High	Immediate	Somewhat	P, Q	R&D	High
Electron beam sterilization	Food	High	High	19.2	None	P, Q	R&D	Low
Heat recovery—low temperature	Food	Medium	Medium	4.8	None	P, Q	Dissem.	Low
Membrane technology—food	Food	High	High	2.2	Somewhat	P, Q	Dissem., R&D	Medium
Cooling and storage	Food	Medium	Medium	2.6	Somewhat	O	Dissem., Demo	Medium
100% recycled glass cullet	Glass	Medium	High	2.0	Significant		Demo	High
Hi-tech facilities HVAC	Crosscutting	Medium	High	4.0	None	P	Dissem.	Medium
Advanced lighting technologies	Crosscutting	High	High	1.3	None	P, Q, O	Dissem., Demo	High
Advanced lighting design	Crosscutting	High	High	3.0	None	P, Q, O	Dissem., Demo	Medium
Variable wall mining machine	Mining	Low	Low	10.6	None	P, S	Demo	Low
Advance ASD designs	Crosscutting	High	Medium	1.1	None	P, Q	R&D	High
Advanced compressor controls	Crosscutting	Medium	Low	0.0	None	P, Q	Dissem.	Medium
Compressed air system management	Crosscutting	High	High	0.4	None	P, Q	Dissem.	Medium
Motor diagnostics	Crosscutting	Low	Low	Immediate	None	P, Q	Dissem., Demo	High
Motor system optimization	Crosscutting	High	High	1.5	Somewhat	P, Q	Dissem., Train	Medium
Pump efficiency improvement	Crosscutting	High	High	3.0	None	P, Q	Dissem., Train	Medium
Switched reluctance motor	Crosscutting	Medium	Low	7.4	None	P, Q	R&D	Medium
Advanced lubricants	Crosscutting	Medium	Medium	0.1	Significant	P, Q	Dissem.	Medium
Anaerobic waste water treatment	Crosscutting	Medium	Low	0.8	Significant	O	Dissem., Demo	High
High-efficiency/low NO _x burners	Crosscutting	High	Low	3.1	Significant	P	Dissem., Demo	Medium
Membrane technology wastewater	Crosscutting	High	Medium	4.7	Somewhat	P	Dissem., R&D	High
Process integration (pinch)	Crosscutting	High	Low	2.3	Somewhat	P	Dissem.	Medium
Sensors and controls	Crosscutting	High	Medium	2.0	Somewhat	P, Q	Dissem., R&D, demo	High

Table ES-1. Summary of Profiled Emerging Energy-Efficient Industrial Technologies (continued)

Technology	Sector	Total ¹ Energy Savings	Sector ² Savings	Simple Payback	Environ. Benefits	Other ³ Benefits	Suggested Next Steps	Likelihood of Success
Black liquor gasification	Pulp & paper	High	High	1.5	Somewhat	P, S	Demo	High
Condebelt drying	Pulp & paper	High	Medium	65.2	None	P, Q	Demo	Low
Direct electrolytic causticizing	Pulp & paper	Low	Low	N/A	Somewhat	P, Q	R&D	Medium
Dry sheet forming	Pulp & paper	Medium	Medium	48.3	Somewhat	Q	R&D, demo	High
Heat recovery—paper	Pulp & paper	High	Medium	3.9	Somewhat	P, S	Demo	Medium
High consistency forming	Pulp & paper	Medium	Medium	Immediate	Somewhat	P, Q	Demo	Medium
Impulse drying	Pulp & paper	High	Medium	20.3	None	P, Q	Demo	Medium
Biodesulfurization	Pet. Refining	Medium	Medium	1.8	None	Q	R&D, demo	High
Fouling minimization	Pet. Refining	High	High	N/A	None	P	R&D	Low
BOF gas and sensible heat recovery	Iron & steel	Medium	Medium	14.7	Significant	P	Dissem.	Low
Near net shape casting/strip casting	Iron & steel	High	High	Immediate	Somewhat	P, Q	R&D	High
New EAF furnace processes	Iron & steel	High	High	0.3	Somewhat	P	Field test	High
Oxy-fuel combustion in reheat furnace	Iron & steel	High	Medium	1.2	Significant	P	Field test	High
Smelting reduction processes	Iron & steel	High	High	Immediate	Significant	P	Demo	Medium
Ultrasonic dyeing	Textile	Medium	Medium	0.3	Compelling	P, Q	Demo	Medium
Advanced CHP turbine systems	Crosscutting	High	High	6.9	Significant	P, Q	Policies	High
Advanced reciprocating engines	Crosscutting	High	High	8.3	Limited	P, Q, O	R&D, demo	Medium
Fuel cells	Crosscutting	High	High	58.6	Significant	P, Q	Demo	Medium
Microturbines	Crosscutting	High	Medium	Never	Somewhat	P, Q, O	R&D, demo	Medium

Notes: 1. “High” could save more than 0.1% of manufacturing energy use by 2015, “medium” saves 0.01 to 0.1%, and “low” saves less than 0.01%.

2. “High” could save more than 1% of sector energy use by 2015, “medium” saves 0.1 to 1%, and “low” saves less than 0.1%.

3. “P”=productivity, “Q”=quality, “S”=safety, and “O”=other.