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FOOD SERVICE
COMMERCIAL HAND WRAP MACHINE
SWFS010-02

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MEASURE NAME

Commercial Hand-Wrap Machine

STATEWIDE MEASURE ID

SWFS010-02

TECHNOLOGY SUMMARY

Food items, such as meat and cheese, are often placed on trays and wrapped in plastic film before being displayed for purchase. The plastic wrap protects the food from airborne organisms and dust, allows customers to view the product, and provides a surface for pasting information labels. A hand-wrap machine consists of a heating bar and a heating platform, rated at approximately 0.05 kW and 0.55 kW, respectively. The heating bar cuts the wrapping film as it comes in contact with itself. The heating platform heats up the wrapping film. When the wrapping film is heated, the film sticks to the package and seals the product. Both heating elements of the conventional (always on) hand-wrap machine are kept at a constant temperature of 280 °F.

An on-demand hand wrap machine is similar to the conventional model but has a more powerful heating platform (rated at approximately 2 kW), which is switched ON/OFF by a controller. By default, the heating platform is OFF. The two types of controllers are:

- A mechanical system where pressure must be applied down onto the heating platform. Applying pressure to the heating platform engages a switch, which activates the 2-kW heating platform until the switch is disengaged or for a maximum of three seconds.
- An optical system which uses an optical eye to detect that an item is being sealed. The optical eye is placed in the front center of the heating platform. When a package is set on the heating platform, light is reflected into the eye, which activates the heating platform until the item is removed or for a maximum of three seconds.

Measure savings result from the elimination of standby losses. That is, on-demand controls prevent the heating platform from being maintained at an elevated temperature when not in use. Although an on-demand hand-wrap machine has a more powerful heating element than an always-on machine (2 kW compared to 0.55 kW), the total hours of operation are much less. Since hand wrap machines are ON for a significant number of hours every day but only in actual use a fraction of the time, there is substantial savings potential with the on-demand models.

MEASURE CASE DESCRIPTION

This measure case is defined as a new commercial on-demand hand-wrap machine that replaces a conventional or always-on hand-wrap machine. The Southern California Edison (SCE) Food Service Technology Center (FSTC) conducted a field study¹ to evaluate and compare the energy savings and

¹ Southern California Edison (SCE), Emerging Products. 2015. *Commercial Hand Wrap Machines for Food Service Applications Field Test*. ET13SCE1190.

demand reduction potential of always-on (base case) package sealers compared to on-demand (measure case) package sealers.

BASE CASE DESCRIPTION

The base case is defined as an always-on commercial electric hand-wrap machine. The Southern California Edison (SCE) Food Service Technology Center (FSTC) conducted a field study² to evaluate and compare the energy savings and demand reduction potential of an always-on (base case) package sealer compared to an on-demand (measure case) package sealer.

CODE REQUIREMENTS

This measure is not governed by either state or federal codes and standards.

Applicable State and Federal Codes and Standards

Code	Applicable Code Reference	Effective Date
CA Appliance Efficiency Regulations – Title 20 (2019)	None.	January 1, 2019
CA Building Energy Efficiency Standards – Title 24 (2019)	None.	January 1, 2020
Federal Standards	None.	n/a

NORMALIZING UNIT

Each (machine).

PROGRAM REQUIREMENTS

Measure Implementation Eligibility

All combinations of measure application type, delivery type, and sector that are established for this measure are specified below. Measure application type is a categorization based on the circumstances and timing of the measure installation; each measure application type is distinguished by its baseline determination, cost basis, eligibility, and documentation requirements. Delivery type is the broad categorization of the delivery channel through which the market intervention strategy (financial incentives or other services) is targeted. This table also designates the broad market sector(s) that are applicable for this measure.

Note that some of the implementation combinations below may not be allowed for some measure offerings by all program administrators.

² Southern California Edison (SCE), Emerging Products. 2015. *Commercial Hand Wrap Machines for Food Service Applications Field Test*. ET13SCE1190.

Implementation Eligibility for Investor-Owned Utilities

Measure Application Type	Delivery Type	Sector
Normal replacement	DnDeemed	Ag
Normal replacement	DnDeemed	Ind
Normal replacement	DnDeemed	Com
Normal replacement	UpDeemed	Ag
Normal replacement	UpDeemed	Ind
Normal replacement	UpDeemed	Com
New construction	DnDeemed	Ag
New construction	DnDeemed	Ind
New construction	DnDeemed	Com
New construction	UpDeemed	Ag
New construction	UpDeemed	Ind
New construction	UpDeemed	Com

Eligible Products

This measure is a new commercial on-demand hand-wrap machine that replaces a conventional or always-on hand-wrap machine. The measure must use either a mechanical or optical control system.

Eligible Building Types and Vintages

This measure is applicable for any nonresidential building type of any vintage.

Eligible Climate Zones

This measure is applicable to any California climates zone.

PROGRAM EXCLUSIONS

Used or rebuilt equipment is not eligible.

DATA COLLECTION REQUIREMENTS

Data collection requirements will include the incentive recipient consistent with the referenced EM&V Protocols and not the customer/ratepayer. The site data will contain location and contact information for stores, contractors, or other service providers where the ultimate customer purchase occurs.

An example of the new data requirements for upstream and midstream programs is provided below:

- Site ID – A unique identifier for the installed location of the incentivized equipment
- Equipment ID - A unique identifier for each unit of incentivized equipment on the site
- Measure Size category – General size or capacity range specific to each measure type, for example HVAC equipment would be AHRI product type and size range
- Equipment manufacturer – Manufacturer of the incentivized equipment



- Equipment model number – Manufacturer number that can be used to lookup size, features, performance, etc. for the incentivized equipment
 - Rated capacity – Actual size, capacity, load rating, etc. for the incentivized equipment
 - Rated efficiency unit (EfficUnit) – The engineering unit basis for the efficiency or performance rating, e.g., Unit Energy Factor (UEF), thermal efficiency (TE), SEER (seasonal energy efficiency ratio)
 - Rated efficiency (ref. EfficUnit) – Efficiency or performance rating value for the Rated efficiency unit basis
 - Quantity per sales transaction, project, or site – Total units of incentivized equipment located at the site or project

USE CATEGORY

Food service (FoodServ)

ELECTRIC SAVINGS (kWh)

The unit energy savings (UES) of this measure were derived from the *Commercial Hand Wrap Machines for Food Service Applications Field Test* study conducted by Southern California Edison (SCE) through the Emerging Technologies Program in 2015.³ The SCE 2015 Field Test monitored hand wrap machines in the bakery, deli, and meat departments at ten supermarket locations in the SCE service territory; both base case and measure case hand wrap machines were monitored for six weeks at 10-second intervals. For each chain, an average unit energy consumption (UEC) was calculated for units in bakery and deli departments, and separate average UEC was calculated for units in meat departments. The average UEC values for each use type were then averaged together to calculate the overall average UEC and peak demand.

The average UES (and peak demand reduction) are calculated as the difference between the baseline and measure case UEC (and peak demand). The energy savings results from eliminating standby losses. Using on-demand controls prevent the heating platform from being maintained at an elevated temperature when not in use. Although an on-demand hand wrap machine has a more powerful heating element than an always-on machine (2 kW compared to 0.55 kW), the total hours of operation are significantly reduced. Since hand wrap machines are ON for a significant number of hours every day but only in use a fraction of the time, there is substantial savings potential with the on-demand models.

³ Southern California Edison (SCE), Emerging Products. 2015. *Commercial Hand Wrap Machines for Food Service Applications Field Test*. ET13SCE1190.

PEAK ELECTRIC DEMAND REDUCTION (KW)

The peak demand measurements were derived from the *Vacuum-Sealing and Packaging Machines for Food Service Applications Field Test* study conducted through the Emerging Technologies Program.⁴ The measured peak demand values represent the demand reduction during the Database of Energy Efficient Resources (DEER) peak period of 4 p.m. to 9 p.m. weekdays,⁵ thus a coincident demand factor (CDF) was not applied.

GAS SAVINGS (THERMS)

Not applicable.

LIFE CYCLE

Effective useful life (EUL) is an estimate of the median number of years that a measure installed through a program is still in place and operable. Remaining useful life (RUL) is an estimate of the median number of years that a technology or piece of equipment replaced or altered by an energy efficiency program would have remained in service and operational had the program intervention not caused the replacement or alteration.

The EUL specified for commercial hand wrap machines are below. Note that RUL is only applicable for add-on and accelerated replacement measures and not applicable for this measure.

Effective Useful Life and Remaining Useful Life

Parameter	Value	Source
EUL (yrs)	10.0	University of California, Office of the President, Purchasing Services. 2018. "Useful Life Index, G8605: Cutters, Slicers, Saws, Choppers, Graters, Grinders, Universal Mach, Food Prep."
RUL (yrs)	n/a	n/a

BASE CASE MATERIAL COST (\$/UNIT)

For *all delivery types*, the base case material cost was calculated as the average manufacturer list prices of applicable hand wrap machines obtained from online retailers during the third quarter of 2021.⁶ Manufacturer published list prices and discounts vary; the average base case price represents the non-discounted prices used since equipment pricing in the food service industry is closely held information and prices vary widely according to buying volume and other factors.

⁴ Southern California Edison (SCE), Emerging Products. 2015. *Commercial Hand Wrap Machines for Food Service Applications Field Test*. ET13SCE1190.

⁵ California Public Utilities Commission (CPUC). 2018. *Resolution E-4952*. October 11. Op 1.

⁶ Southern California Edison (SCE). 2021. "SWFS010-02 MeasureDataSpec – Comm Hand Wrap Machine", Cost Data tab

MEASURE CASE MATERIAL COST (\$/UNIT)

The measure case material cost for *all delivery types* was derived from online retailers during the third quarter of 2021.⁷ Manufacturer published list prices and discounts vary; the average base case price represents the non-discounted prices since equipment pricing in the food service industry is closely held information and prices vary widely according to buying volume and other factors.

BASE CASE LABOR COST (\$/UNIT)

For *all delivery types*, the estimated installation hours for baseline hand wrap machine were based on professional engineering judgment and multiplied by the RS Means 2021 hourly electrician rate (\$/hr). The installation labor cost inputs are provided below.

Installation Labor Cost Inputs

Parameter	Value	Source
Labor hours	0.50	Professional Engineering Judgement
Labor rate (\$/hour)	\$76.65	RS Means Online Database, Open Shop Electrician Labor Rate, 2021 ⁸

MEASURE CASE LABOR COST (\$/UNIT)

For *all delivery types*, the estimated installation hours for the hand wrap machine were based on professional engineering judgment and multiplied by the RS Means 2021 hourly electrician rate (\$/hr). The installation labor cost inputs are provided below.

Installation Labor Cost Inputs

Parameter	Value	Source
Labor hours	0.50	Professional Judgement
Labor rate (\$/hour)	\$76.65	RS Means Online Database, Open Shop Electrician Labor Rate, 2021

NET-TO-GROSS (NTG)

The net-to-gross (NTG) ratio represents the portion of gross impacts that are determined to be directly attributed to a specific program intervention. These NTG values are based upon the average of all NTG ratios for all evaluated 2006 – 2008 commercial, industrial, and agriculture programs, as documented in the 2011 DEER Update Study conducted by Itron, Inc. These sector average NTGs (“default NTGs”) are applicable to all energy efficiency measures that have been offered through commercial, industrial, and agriculture sector programs for more than two years and for which impact evaluation results are not available.

⁷ Southern California Edison (SCE). 2021. “SWFS010-02 MeasureDataSpec – Comm Hand Wrap Machine”, Cost Data tab

⁸ RS Means Online Database 2021 Labor Rates <https://www.rsmeansonline.com/References/LABORRATE/2-Year%202021%20Labor%20Rates/Open%20Shop%20Labor%20Rates.PDF>

Net to Gross Ratios

Parameter	Value	Source
NTG – Commercial	0.60	Itron, Inc. 2011. <i>DEER Database 2011 Update Documentation</i> . Prepared for the California Public Utilities Commission. Page 15-4 Table 15-3.
NTG – Industrial	0.60	
NTG - Agriculture	0.60	

GROSS SAVINGS INSTALLATION ADJUSTMENT (GSIA)

The gross savings installation adjustment (GSIA) rate represents the ratio of the number of verified installations of the measure to the number of claimed installations reported by the utility. This factor varies by end use, sector, technology, application, and delivery method. This GSIA rate is the current “default” rate specified for measures for which an alternative GSIA has not been estimated and approved.

Gross Savings Installation Adjustment Rate

Parameter	Value	Source
Def-GSIA	1.0	California Public Utilities Commission (CPUC), Energy Division. 2013. <i>Energy Efficiency Policy Manual Version 5</i> . Page 31.

NON-ENERGY IMPACTS

Non-energy impacts for this measure have not been quantified.

DEER DIFFERENCES ANALYSIS

The table below summarizes the inputs and methods that are and are not based upon the Database for Energy Efficient Resources (DEER).

DEER Difference Summary

DEER Item	Comment / Used for Workpaper
Modified DEER methodology	No
Scaled DEER measure	No
DEER Base Case	No
DEER Measure Case	No
DEER Building Types	Yes
DEER Operating Hours	No
DEER eQUEST Prototypes	No
DEER Version	n/a
Reason for Deviation from DEER	DEER does not contain this type of measure.
DEER Measure IDs Used	n/a
NTG	Source: DEER. NTG of 0.60 is associated with NTG ID: <i>Com-Default>2yrs, Agric-Default>2yrs, Ind-Default>2yrs</i>
GSIA	Source: DEER. The value of 1.0 is associated with GSIA ID: <i>Def-GSIA</i>
EUL/RUL	Source: DEER 2017. The value of 10 years is associated with EUL ID: <i>FoodHandWrap</i>

REVISION HISTORY

Measure Characterization Revision History

Revision Number	Revision Complete Date	Primary Author, Title, Organization	Revision Summary and Rationale for Revision Effective Date and Approved By
01	12/31/2017	Jennifer Holmes Cal TF Staff	Draft of consolidated text for this statewide measure is based upon: SCE17CC014, Revision 0 (October 27, 2016) Consensus reached among Cal TF members.
	10/11/2018 10/30/2018	Jennifer Holmes Cal TF Staff	Completed final revisions for submittal of version 01.
	7/1/2019	Ayad Al-Shaikh Cal TF Staff	Updated delivery type IDs.
	12/16/2019	Adan Rosillo PG&E	Added delivery types UpDeemed and DnDeemDI to PG&E offering
02	9/22/2021	Annie Hur, TRC	Updated base and measure case material and labor costs. Material costs are derived from online retailers in third quarter of 2021, while the labor rate is updated based on 2021 RS Means. Direct install delivery type was removed from the workpaper. Added data requirements for midstream and upstream measures