

## Supplementary Information for FLOWSA: A Python package attributing resource use, waste, emissions, and other flows to industries

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The following tables describe in detail the information captured in Flow-By-Activity (FBA) and Flow-By-Sector (FBS) tables.

### Flow-By-Activity Format Specs

Field	Type	Required?	Description
Class	String	Y	Class of the flow. See <a href="#">Flow Classes</a> .
SourceName	String	Y	Name of data source
FlowName	String	Y	ID or name of flow in its native source
FlowAmount	Numeric	Y	The amount of a given flow in its native unit
Unit	String	Y	SI unit acronym. kg for mass flows; MJ for energy flows
FlowType	String	Y	ELEMENTARY_FLOW, TECHNOSPHERE_FLOW, or WASTE_FLOW. See <a href="http://greendelta.github.io/olca-schema/FlowType.html">http://greendelta.github.io/olca-schema/FlowType.html</a>
ActivityProducedBy	String	N*	An activity defined by the source producing a flow.
ActivityConsumedBy	String	N*	An activity defined by the source receiving/consuming a flow.
Compartment	String	Y	Name of compartment to which release goes, e.g. "air," "water," "ground."
Location	String	Y	A numeric representation of the activity location, at a national, state, or county level
LocationSystem	String	Y	Description and year of the Location code, generally FIPS or ISO, e.g. FIPS_2015

Year	Int	Y	Year of data, e.g. 2010
MeasureofSpread	String	N	A measure of spread of a frequency distribution. Acceptable values are RSD for relative standard deviation (aka coefficient of variation) are SD for the normal (aka 'arithmetic') standard deviation, GSD for geometric standard deviation
Spread	Numeric	N	The value for the given measure of spread.
DistributionType	String	N	The form of the frequency distribution, if given. Acceptable values are 'NORMAL,' 'LOGNORMAL,' 'TRIANGULAR,' 'UNIFORM.'
Min	Numeric	N	The minimum FlowAmount, if provided for the data range.
Max	Numeric	N	The maximum FlowAmount, if provided for the data range.
DataReliability	Numeric	Y	A score of data reliability based on reporting values associated with the amount. See <a href="#">Data Quality Pedigree Matrix</a> .
DataCollection	Numeric	Y	A score of data collection based on reporting values associated with the amount. See <a href="#">Data Quality Pedigree Matrix</a> .
Description	String	Y	Original description of the flow

\*At minimum, either ActivityProducedBy or ActivityConsumedBy must be present. If there is a transfer between activities, both must be present.

## Flow-By-Sector Format Specs

Field	Type	Required?	Description
Flowable	String	Y	Name of the flow. See 'Flowable' in <a href="#">fedelemflowlist FlowList</a>
Class	String	Y	Class of flow
FlowAmount	Numeric	Y	The amount of a flow. Uses metric reference units.
SectorProducedBy	String	N*	A valid code from the SectorSourceName system (e.g. '31' for 'NAICS_2012_Code')
SectorConsumedBy	String	N*	A valid code from the SectorSourceName system
SectorSourceName	String	Y	By default, NAICS_2012_Code. Must be the same for SectorProducedBy and SectorConsumedBy.
Context	String	Y	Full context for the flow, e.g. "air," "water," "ground."
Location	String	Y	A numeric representation of the activity location, at a national, state, or county level
LocationSystem	String	Y	Description and year of the Location code, generally FIPS or ISO, e.g. FIPS_2015
Unit	String	Y	SI unit acronym. 'kg' for mass flows; 'MJ' for energy flows.
FlowType	String	Y	ELEMENTARY_FLOW, TECHNOSPHERE_FLOW, or WASTE_FLOW. See <a href="http://greendelta.github.io/olca-schema/FlowType.html">http://greendelta.github.io/olca-schema/FlowType.html</a>
Year	Int	Y	Year of data, e.g. 2010
MeasureofSpread	String	N	A measure of spread of a frequency distribution. Acceptable values are RSD for relative standard deviation (aka coefficient of variation) are SD for the normal (aka 'arithmetic') standard deviation, GSD for geometric standard deviation
Spread	Numeric	N	The value for the given measure of spread.
DistributionType	String	N	The form of the frequency distribution, if given. Acceptable values are 'NORMAL,' 'LOGNORMAL,' 'TRIANGULAR,'

‘UNIFORM.’			
Min	Numeric	N	The minimum FlowAmount, if provided for the data range.
Max	Numeric	N	The maximum FlowAmount, if provided for the data range.
DataReliability	Numeric	Y	A score of data reliability based on reporting values associated with the amount. See <a href="#">Data Quality Pedigree Matrix</a> .
TemporalCorrelation	Numeric	Y	A 1-5 score of data collection based on reporting values associated with the amount. See <a href="#">Data Quality Pedigree Matrix</a> .
GeographicalCorrelation	Numeric	Y	A 1-5 score of data collection based on reporting values associated with the amount. See <a href="#">Data Quality Pedigree Matrix</a> .
TechnologicalCorrelation	Numeric	Y	A 1-5 score of data collection based on reporting values associated with the amount. See <a href="#">Data Quality Pedigree Matrix</a> .
DataCollection	Numeric	Y	A 1-5 score of data collection based on reporting values associated with the amount. See <a href="#">Data Quality Pedigree Matrix</a> .
MetaSources	String	Y	The major data source(s) value is based on, usually a FlowByActivity set.
FlowUUID	String	Y	UUID from Federal Commons Flow List.

- At minimum, either SectorProducedBy or SectorConsumedBy must be present. If there is a transfer between sectors, both must be present.