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WORKSHOP ON DESIGNING SUSTAINABLE ENERGY SYSTEMS
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Representation of Load Variation in MESSAGE

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These are preliminary lecture notes, intended only for distribution to participants.

Representation of Load Variation in MESSAGE

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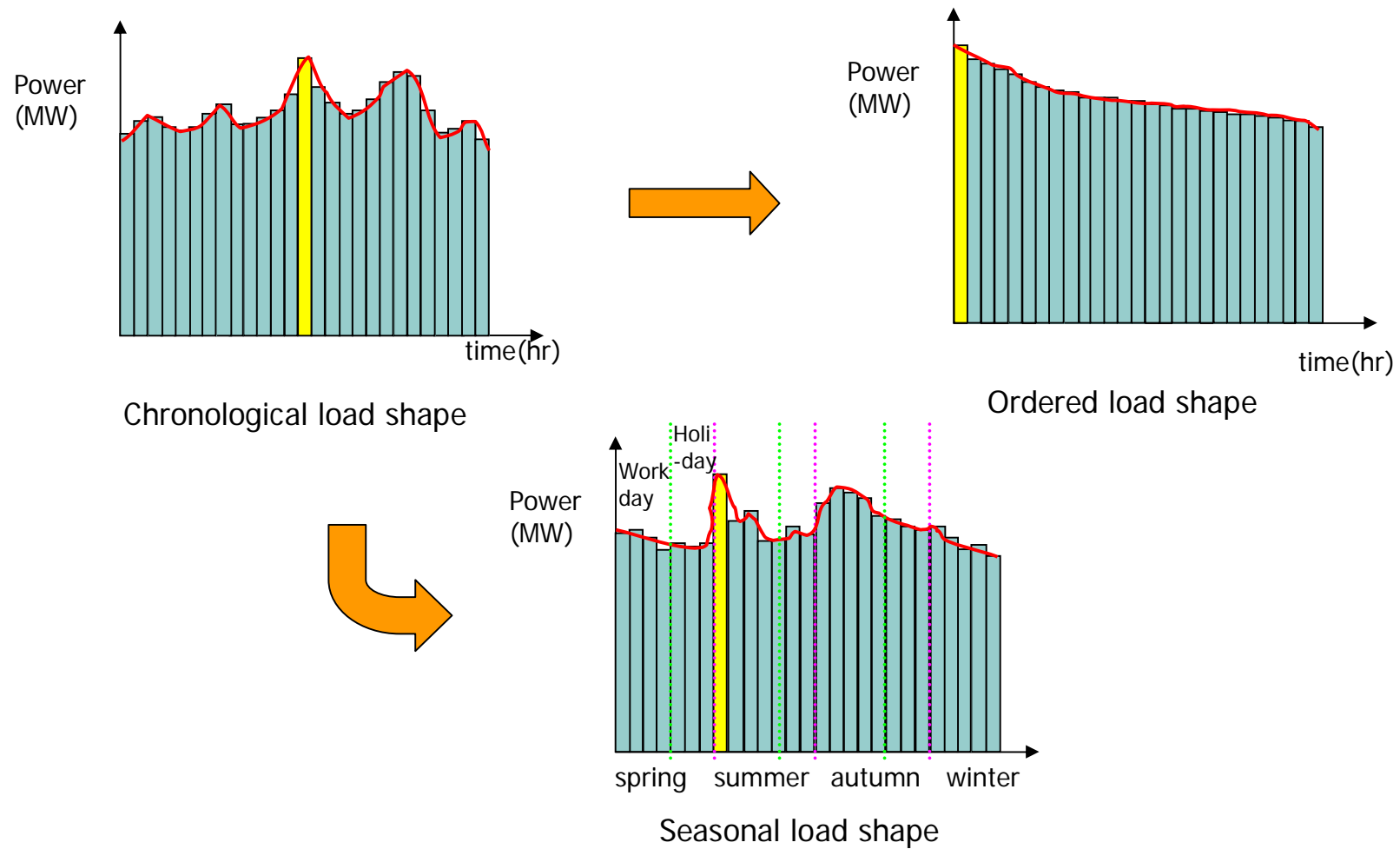
Load variation in MESSAGE

- MESSAGE generates equations & constraints at the annual basis or multi-year period basis
- Load variations in a year can also be addressed, if needed
 - Variation in electricity or heat demands
 - Supply pattern of solar power plant
- Load variation in MESSAGE: Daily, Weekly, or Seasonal variation in demands during a year
- Load Variation during a year can be represented by Load Regions and Load Curves

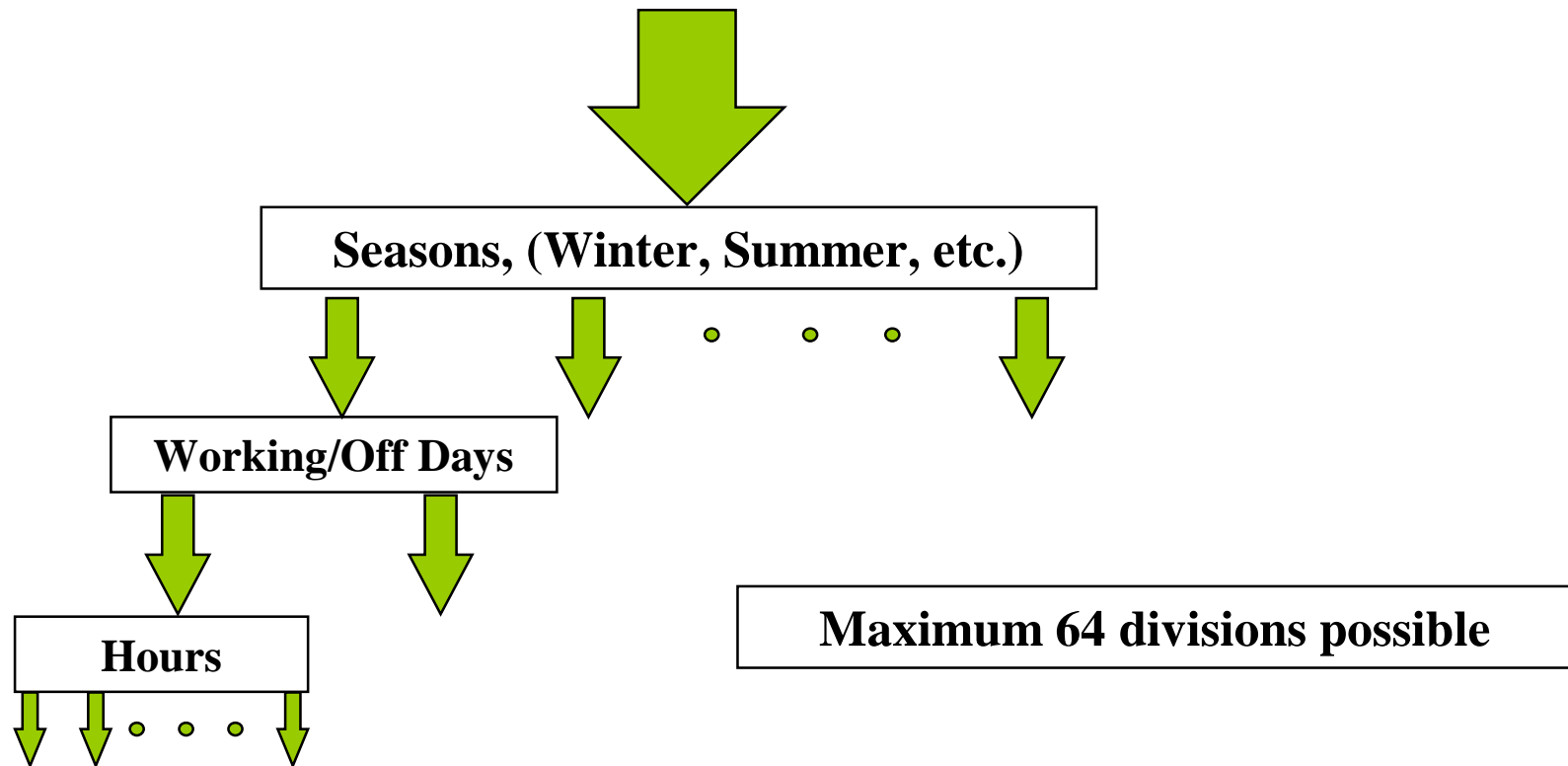
Load Regions

- Load Variation during a year can be represented by Load Regions and Load Curves
- Load regions are the time slices of a year corresponding to the various loads.
- Each Year can be divided into several Load Regions in various ways
 - Seasonal,
 - Chronological,
 - Ordered
- Number of Load Regions may vary for different years
- Only one set of load regions can be defined in a year
 - Defined Load regions for demand is to use for generating load curves of supply technologies and constraints

Various Representations of Load data



Seasonal Load Regions



Steps for defining load curves in MESSAGE

1. Define the load regions
2. Specify which energy form will have load region in the Energy forms screen
3. Define the demands and enter their demand data
4. Define load curves in the Demand screen

Defining load regions(2)

IAEA - MESSAGE V demo1 adb

Screen Help

Load region definition

Country: demo1 Holiday tables Day types

Type: seasonal Year: 2002 No. of seasons: 3

Name	Start date	days	parts
oneseason	2002-01-01	2	3
newseason	2002-07-01	2	3
newseason1	2002-08-01	1	1

oneseason	newseason	newseason1
Workday	SSH	

name	length	name	length
lr1	0.2	lr1	0.6
lr2	0.5	lr2	0.4
lr3	0.3	Total	1.0
Total	1.0		

Number of day types

Number of parts at the 1st day type

Number of parts at the 2nd day type

Chain

Link the load region to the Energy forms

The screenshot displays the 'Energy forms' screen in the IAEA - MESSAGE V demo1 adb application. The left sidebar contains several menu items: General, Load regions, Energyforms (highlighted with a red box), Demands, Constraints, Technologies, Storages, Resources, and Chain. The main area shows a table of energy forms with columns for level name, id, and description. The 'final' level is selected, and a dialog box titled 'Level: final' is open, showing a table of energy forms with columns for energy form, id, hasldr, ix, unittype, unit, and description. The 'electricity' row has the 'hasldr' checkbox checked, and the 'oil' row has it unchecked. A blue callout box labeled 'Double click' points to the 'final' level in the table.

IAEA - MESSAGE V demo1 adb

Screen Help

General
Load regions
Energyforms
Demands
Constraints
Technologies
Storages
Resources

Chain

Energy forms

tdb adb

Ins Add Del

level name (double click to show fuels) id description

level name	id	description
final	f	
secondary	s	
primary	p	
resources	r	

Level: final

Ins Add Del Save Quit

energy form	id	hasldr	ix	unittype	unit	description
electricity	e	<input checked="" type="checkbox"/>	<input type="checkbox"/>	energy	MWyr	
oil	o	<input type="checkbox"/>	<input type="checkbox"/>	energy	MWyr	

Double click

Define the demands & enter demand data

IAEA - MESSAGE V demo1 adb

Screen Help

General
Load regions
Energyforms
Demands
Constraints
Technologies
Storages

Demands

Add Delete Import load curves: abs/rel Import

energy form/level	unit	switch	data (double click to edit)	Comment	Import
electricity/final	MW/yr	cg	200		
oil/final	MW/yr	c	50		

Annual demand

IAEA - MESSAGE V demo1 adb

Screen Help

General
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Resources

Demands

Add Delete Import load curves: abs/rel Import

energy form/level	unit	switch	data (double click to edit)	Comment	Import
electricity/final	MW/yr	cg			
oil/final	MW/yr	c			

Define load curves

