Fall 2015

Living Building Challenge

Emily Jane Bedell
Portland State University

Hayley Nelke
Portland State University

SRG Architects

LIVING BUILDING CHALLENGE

SRG

PLACE:
01- LIMITS TO URBAN GROWTH
02- URBAN AGRICULTURE
03- HABITAT EXCHANGE
04- HUMAN POWERED LIVING
WATER:
05- NET POSITIVE WATER
ENERGY:
06- NET POSITIVE ENERGY
HEALTH AND HAPPINESS:
07- CIVILIZED ENVIRONMENT
08- HEALTHY INTERIOR ENVIRONMENT
09- BIOPHILIC ENVIRONMENT

MATERIALS:
10- RED LIST
11- EMBODIED CARBON FOOTPRINT
12- RESPONSIBLE INDUSTRY
13- LIVING ECONOMY SOURCING
14- NET POSITIVE WASTE
EQUITY:
15- HUMAN SCALE+ HUMANE PLACES
16- UNIVERSAL ACCESS TO NATURE + PLACE
17- EQUITABLE INVESTMENT
18- JUST ORGANIZATIONS
BEAUTY:
19- BEAUTY+SPIRIT
20- INSPIRATION+EDUCATION

The objective of this research is to investigate, in depth, the Materials Petal of the Living Building Challenge and present a methodology to easily navigate the Petal. The Multnomah County Courthouse building was used as a case study for the methodology. This research hopes to affect the building specifications to create a more sustainable and environmentally conscious procedure for building material selection.

The Living Economy Sourcing imperative intends to promote growth of local economic structure while reducing negative transportation related effects on human and environmental health. Requirements for material sourcing distances are presented in this imperative, as seen in the map below, from Portland, OR. The manufacturer location is defined as the place where the final product is fabricated and assembled. A distribution facility does not qualify as a products' manufacturer location. Methods of improving and localizing the total sourcing radius should be researched.

LIVING BUILDING CHALLENGE
MATERIALS PETAL IMPERATIVE

KEY

DELIVERABLE   REQUIREMENT   ACTION
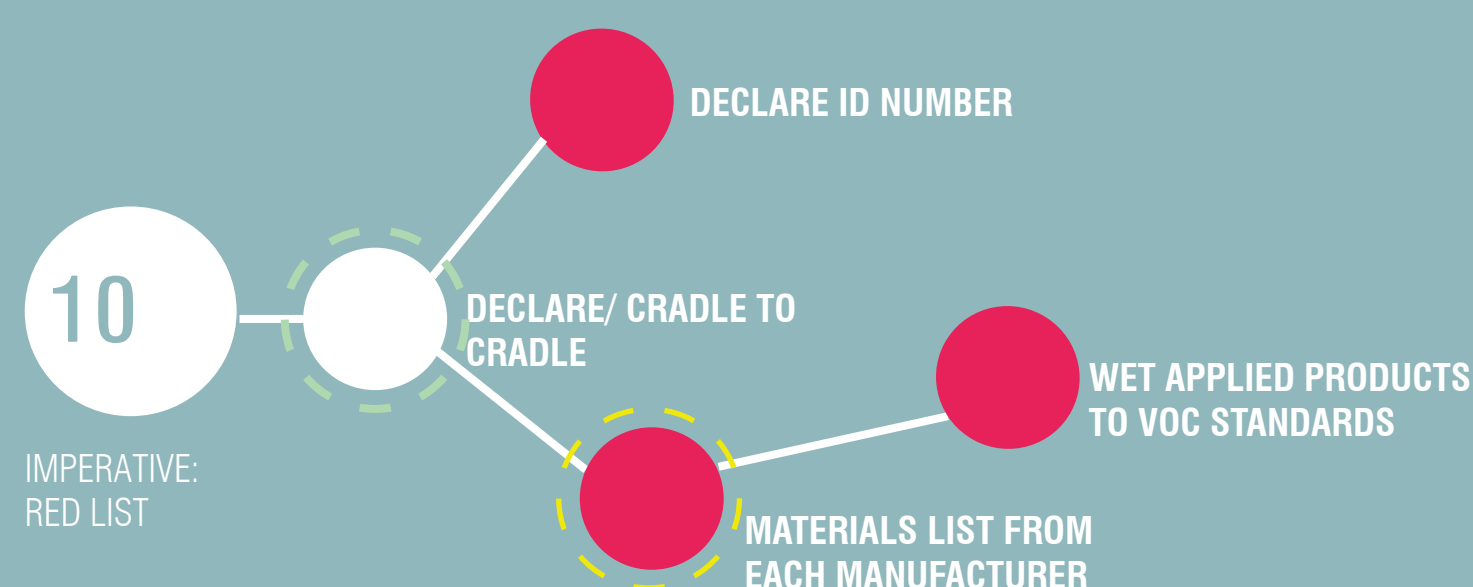
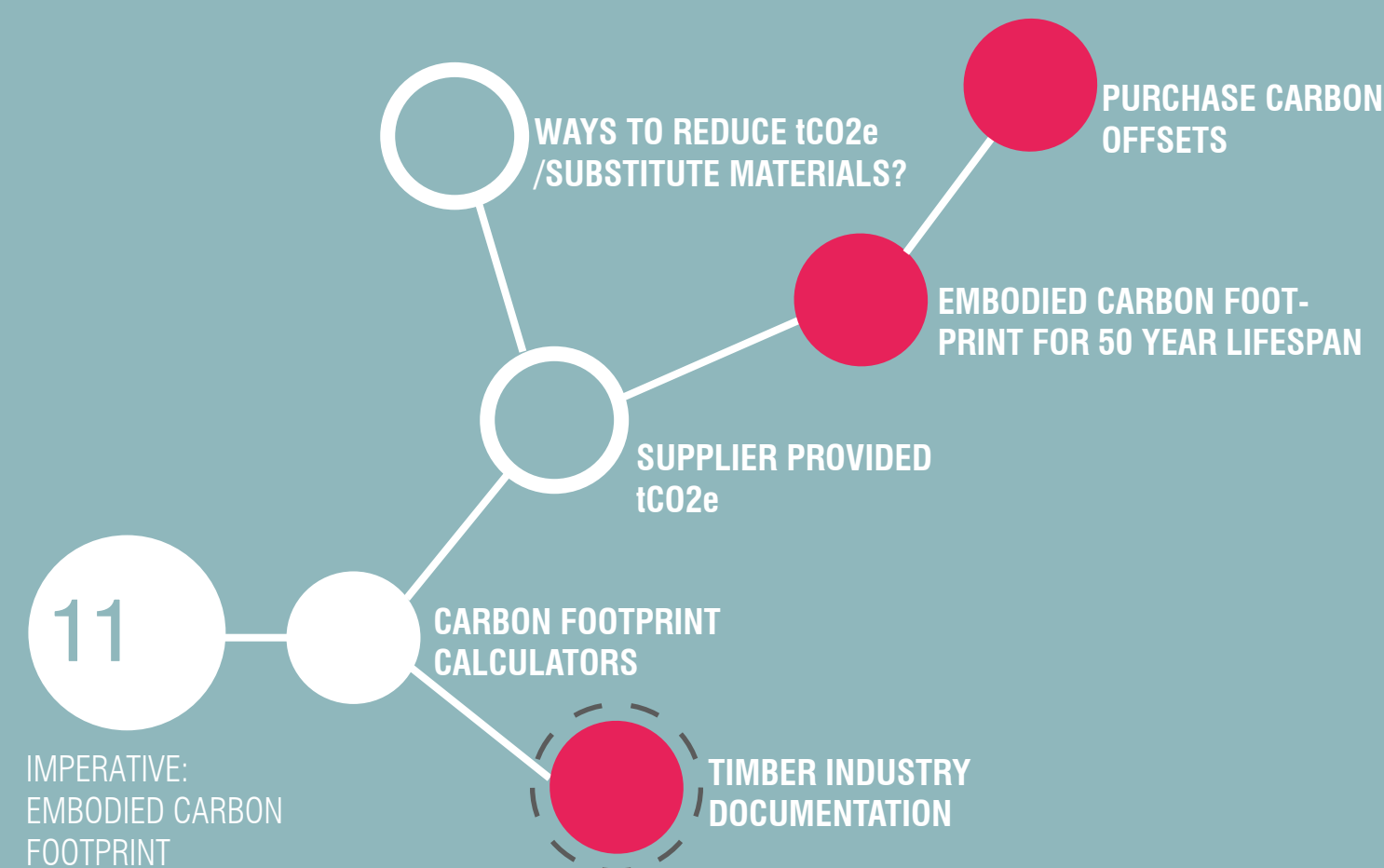Related deliverables/Reqs/ Actions from separate imperatives share a border

10
IMPERATIVE: RED LIST

INTENT- FACTOR OUT THE MATERIALS WITH THE GREATEST NEGATIVE IMPACT ON HUMAN AND ENVIRONMENTAL HEALTH. PROJECT MAY NOT CONTAIN ANY RED LIST MATERIALS
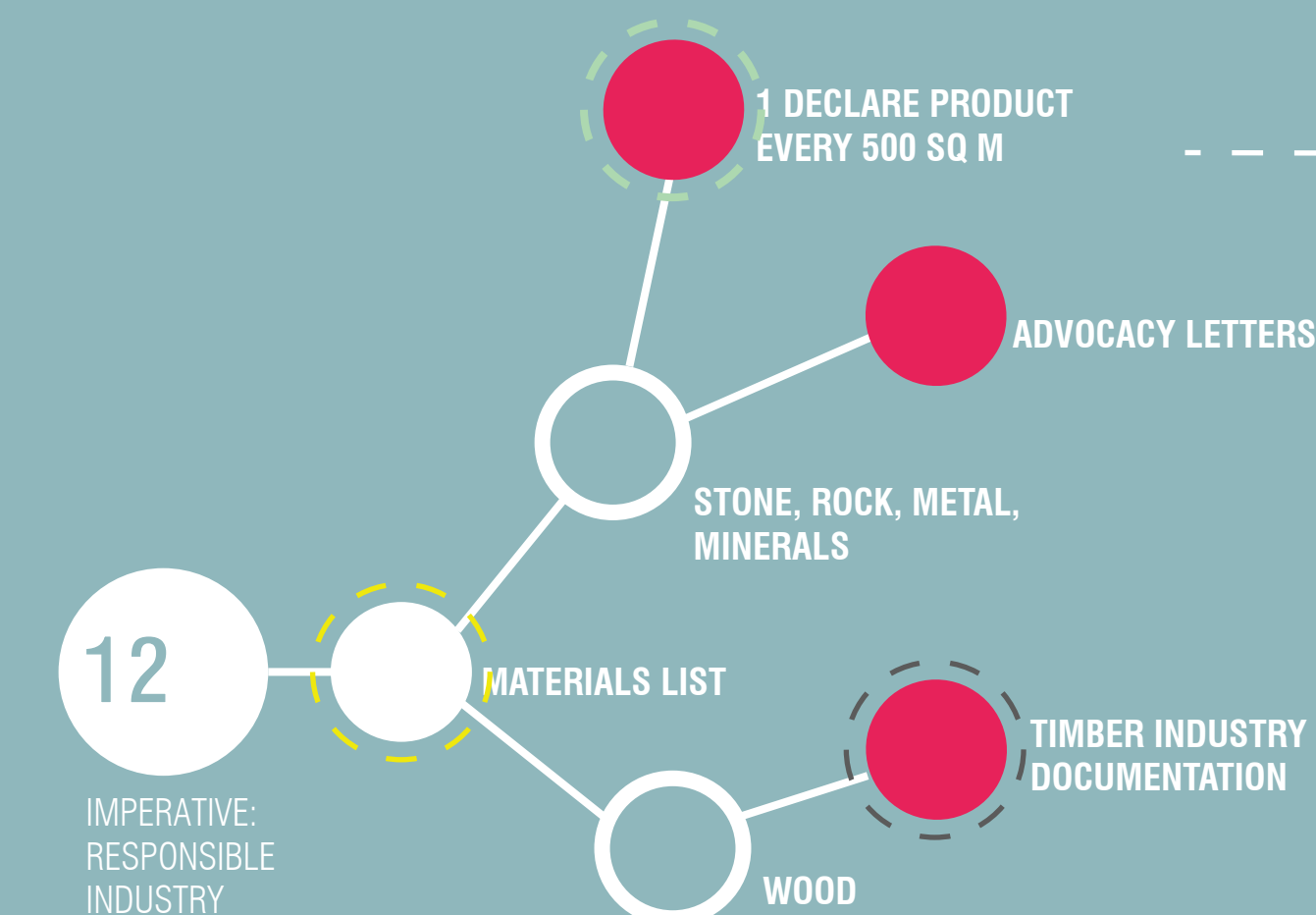
11
IMPERATIVE: EMBODIED CARBON FOOTPRINT

INTENT- REDUCE EMBODIED CARBON FOOTPRINT OF BUILDING OVER ENTIRE LIFESPAN. CALCULATIONS MUST BE PROJECTED AT A 50 YEAR STANDARD TO PROVIDE ACCURATE AND CONSISTENT MEASUREMENTS.
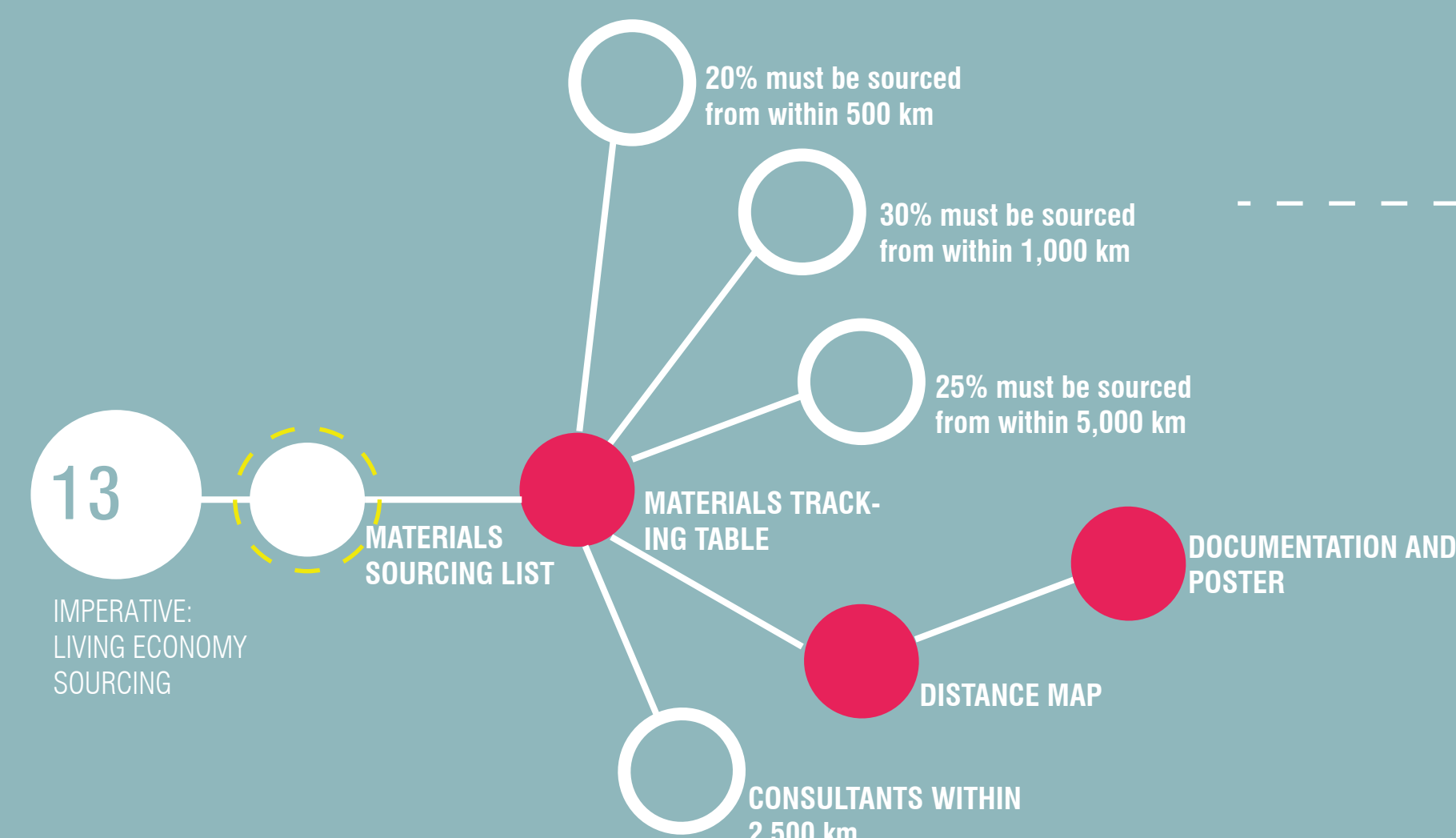
12
IMPERATIVE: RESPONSIBLE INDUSTRY

INTENT- PROMOTE AN AWARENESS WITHIN THE INDUSTRY AND REDUCE RELIANCE ON HARMFUL INGREDIENTE AND EXTRACTION OF NATURAL RESOURCES
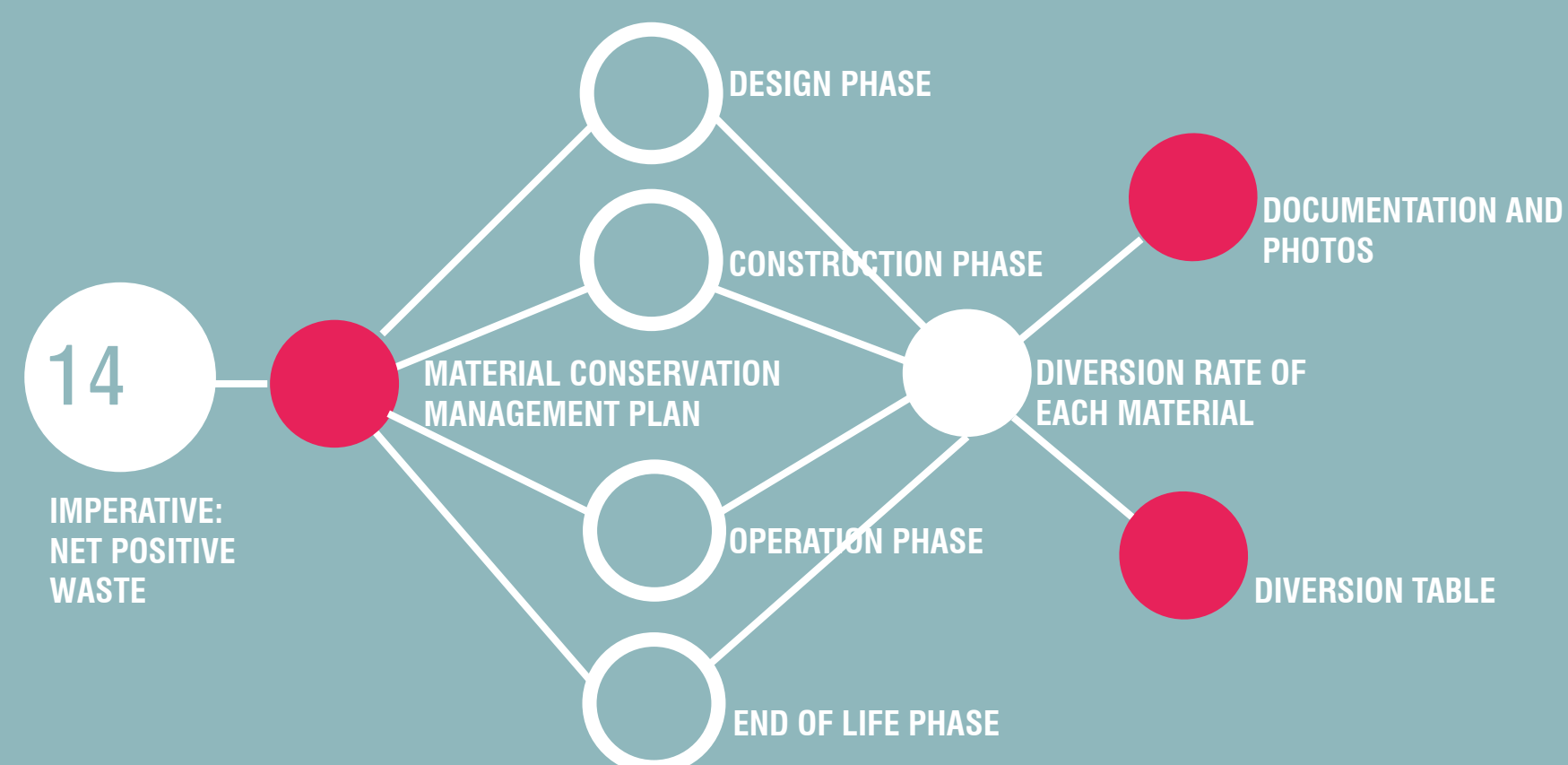
13
IMPERATIVE: LIVING ECONOMY SOURCING

INTENT- PROMOTE GRWTH OF LOCAL ECONOMIC STRUCTURE WHILE REDUCING NEGATIVE TRANSPORTATION RELATED EFFECTS ON HUMAN AND ENVIRONMENTAL HEALTH
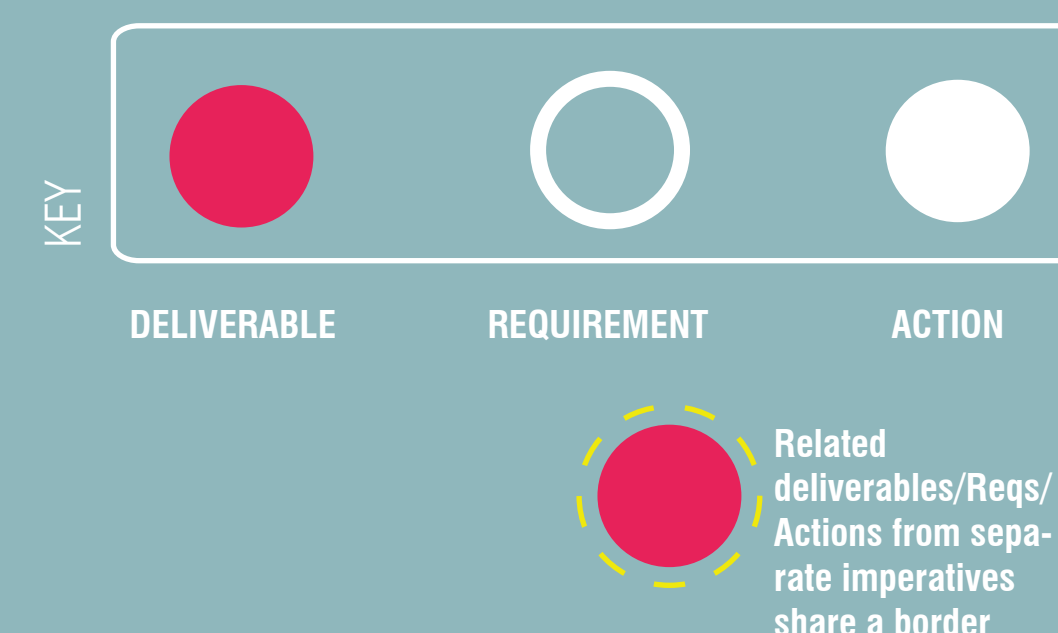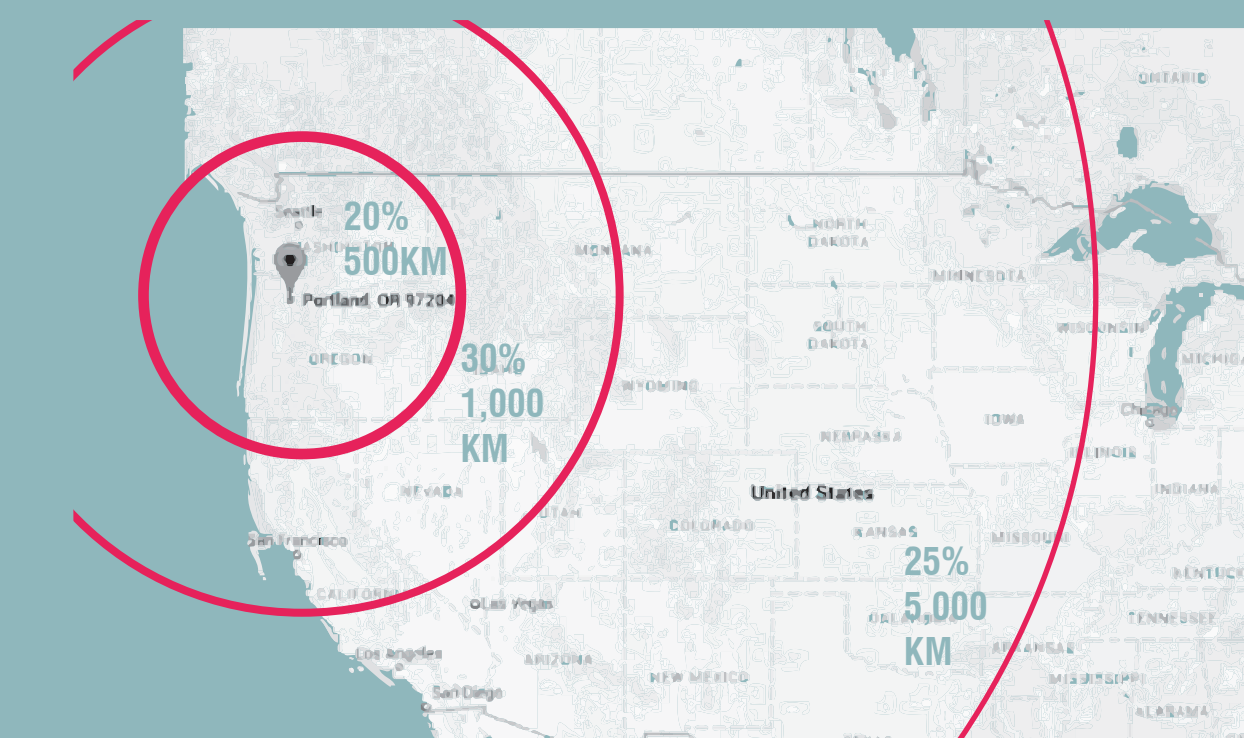
14
IMPERATIVE: NET POSITIVE WASTE

INTENT- DIVERT WASTE STREAM THROUGH REUSE AND REINTRODUCTION AS PRODUCT NUTRIENTS.

10
IMPERATIVE: RED LIST

DECLARE ID NUMBER
DECLARE/ CRADLE TO CRADLE
WET APPLIED PRODUCTS TO VOC STANDARDS
MATERIALS LIST FROM EACH MANUFACTURER

11
IMPERATIVE: EMBODIED CARBON FOOTPRINT

WAYS TO REDUCE tCO2e /SUBSTITUTE MATERIALS?
PURCHASE CARBON OFFSETS
EMBODIED CARBON FOOTPRINT FOR 50 YEAR LIFESPAN
SUPPLIER PROVIDED tCO2e
CARBON FOOTPRINT CALCULATORS
TIMBER INDUSTRY DOCUMENTATION

12
IMPERATIVE: RESPONSIBLE INDUSTRY

1 DECLARE PRODUCT EVERY 500 SQ M
ADVOCACY LETTERS
STONE, ROCK, METAL, MINERALS
MATERIALS LIST
TIMBER INDUSTRY DOCUMENTATION
WOOD

13
IMPERATIVE: LIVING ECONOMY SOURCING

20% must be sourced from within 500 km
30% must be sourced from within 1,000 km
25% must be sourced from within 5,000 km
MATERIALS SOURCING LIST
MATERIALS TRACKING TABLE
DOCUMENTATION AND POSTER
DISTANCE MAP
CONSULTANTS WITHIN 2,500 km

14
IMPERATIVE: NET POSITIVE WASTE

DESIGN PHASE
CONSTRUCTION PHASE
MATERIAL CONSERVATION MANAGEMENT PLAN
DIVERSION RATE OF EACH MATERIAL
DOCUMENTATION AND PHOTOS
OPERATION PHASE
DIVERSION TABLE
END OF LIFE PHASE

The objective of the Responsible Industry imperative is to improve the industry's social and environmental impacts of their practices. The standard wishes to promote awareness within the industry and reduce reliance on harmful ingredients and extraction of natural resources. The requirement is that there be at least one Declare product for every 500 square meters of gross building area.

20%
500KM
Portland OR 97204
30%
1,000 KM
25%
5,000 KM

United States

17 STORIES
451,000 SQ FT

451,000 sq ft/ 1 declare product every 5382 sq ft = 84 declare products