

Methodology and prioritization

WP2

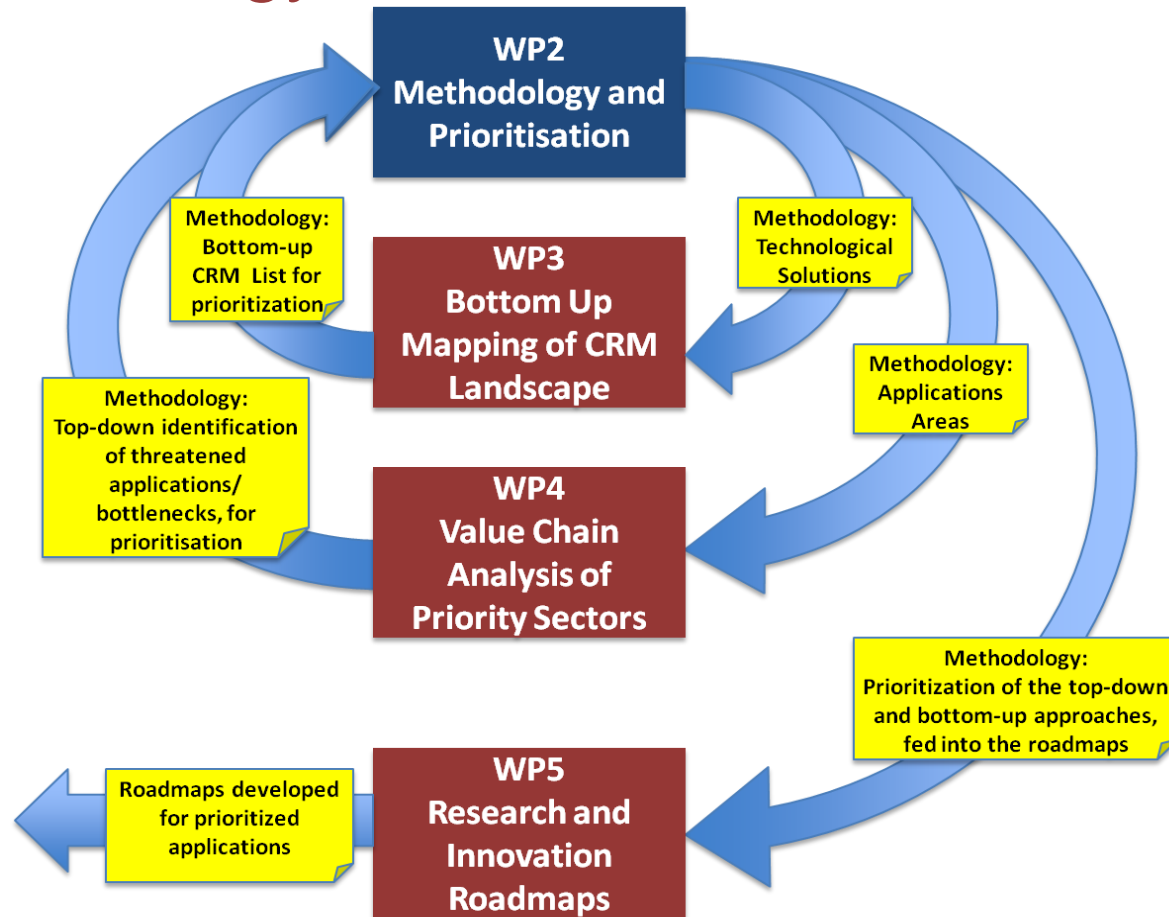
Brussels – May 15, 2014

Methodology and Prioritisation Objectives

Objectives have been pursued in two stages:

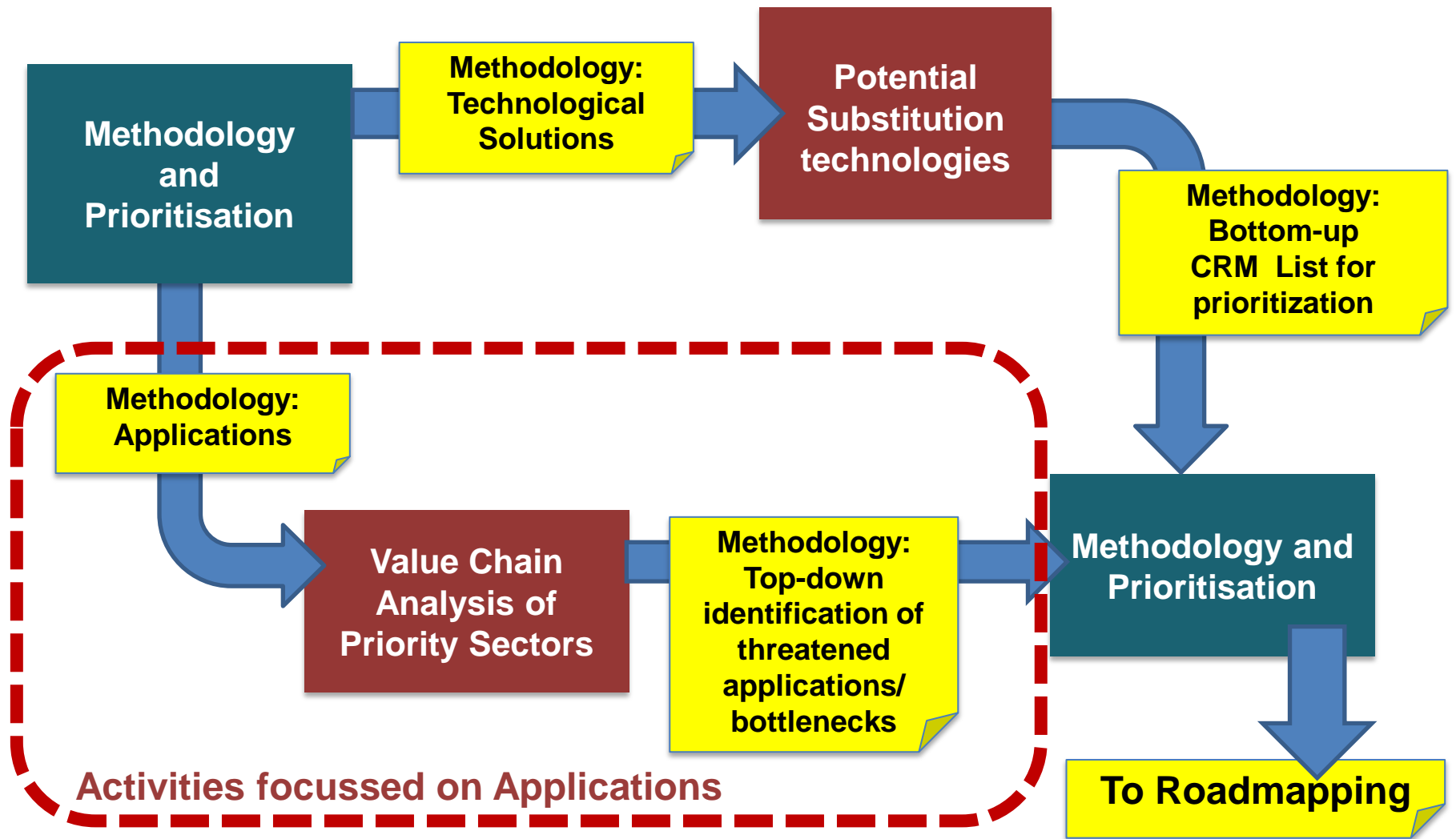
- To develop methodologies that will provide relevant information concerning the CRM flows:
 - identify the most relevant sources of information concerning materials and products flows
 - identify worldwide trends for materials flows into products
 - Input the relevant information to be ‘extracted’ from stakeholders, in order to guide the collection of relevant info for further analysis
- To apply the acquired methodologies onto:
 - Applications
 - Technological Solutions
- providing the basis to potential substitution trajectories

Methodology and Prioritisation Workflow



- Applications and Technological solutions are the objects of prioritization

Methodology and Prioritisation Workflow



Evaluation Criteria for Applications

- Three criteria are used (namely: Economic, Availability of Raw Materials and Strategic Relevance) to evaluate the applications:
 - The **Economic** assesses the relevance of an application at stake = **jobs involved (E)**
 - The **Raw Materials Risk of Availability** relates to the presence, the intensity and the function of critical materials in the applications **(A)**
 - The **Strategic Relevance** is associated to the EU policies for CRMs supply, possible EU targets and potential future developments **(S)**
- Applications belong to three sectors:
 - ICT, Electric and Electronics
 - Energy
 - Transportation

Evaluation Criteria for Applications

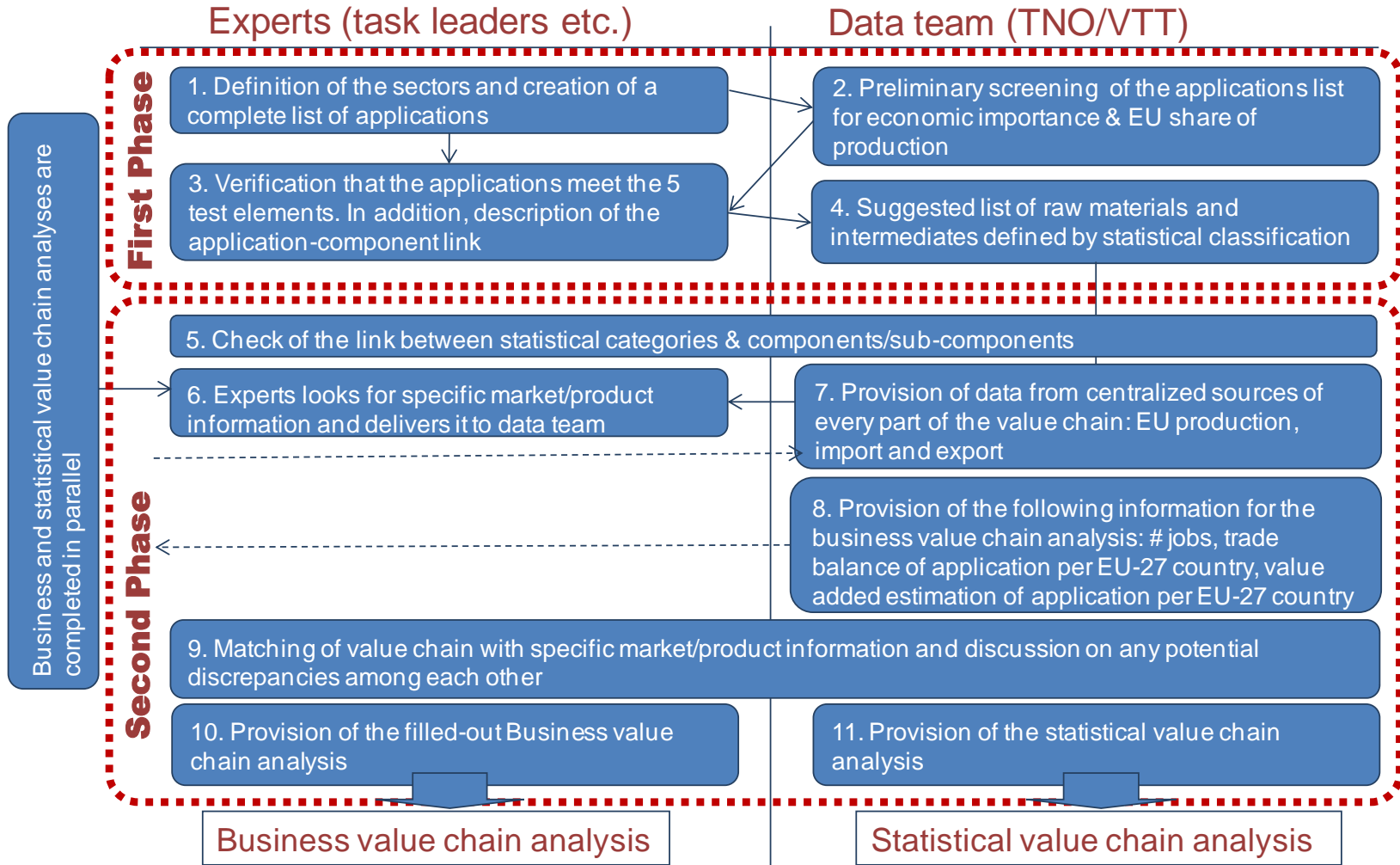
- The completed value chain descriptions according to the criteria are then ranked in accordance to score 0, 1, or 3
- Scores are assigned depending on the type of criteria and its value:
 - 0 if the criterion is below average / detrimental / at the threshold
 - 1 if the criterion is on average / neutral / above the threshold
 - 3 if the criterion is above average / improving / significantly above the threshold

Scores for the Criteria

Dimension	Criterion	0	1	3
Economic (E)	Global market share of European production	<10%	10-25%	>25%
	Jobs involved in the EU (excluding indirect jobs)	Low (<2,000)	Medium	High (>20,000)
Availability (A)	Amount of CRMs involved	Low and only in few steps/components of the VC	Medium and in some steps/comp. of the VC	High and in a high number of steps/comp. of the VC
	Expected future market development	Low	Medium	High
	CRM function	Marginal	Moderate	Essential
	Availability and status of substitutes or mitigation potential.	High / pre-commercial phase	Medium / development phase	Low / still in a research phase
Strategic Relevance (S)	Availability of the application is of relevance for specific European policies	No relevance	Low relevance	High Relevance

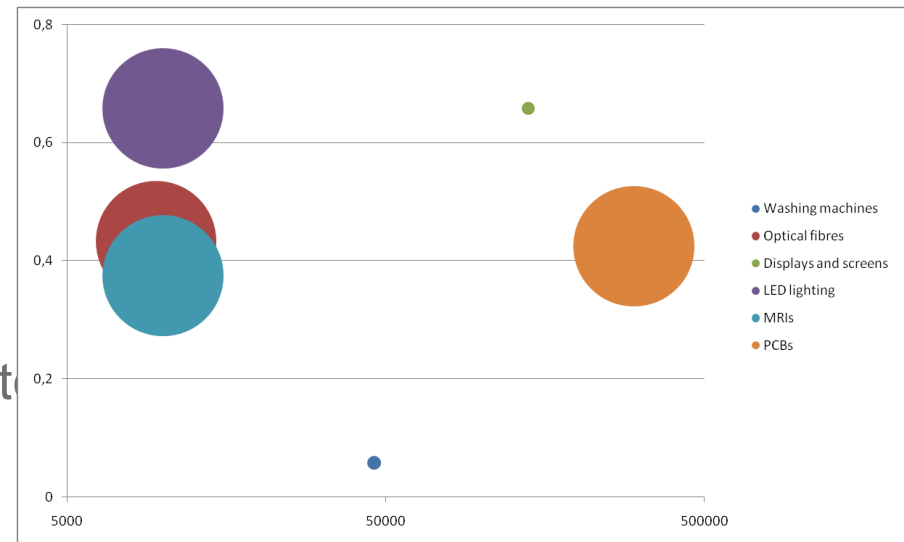
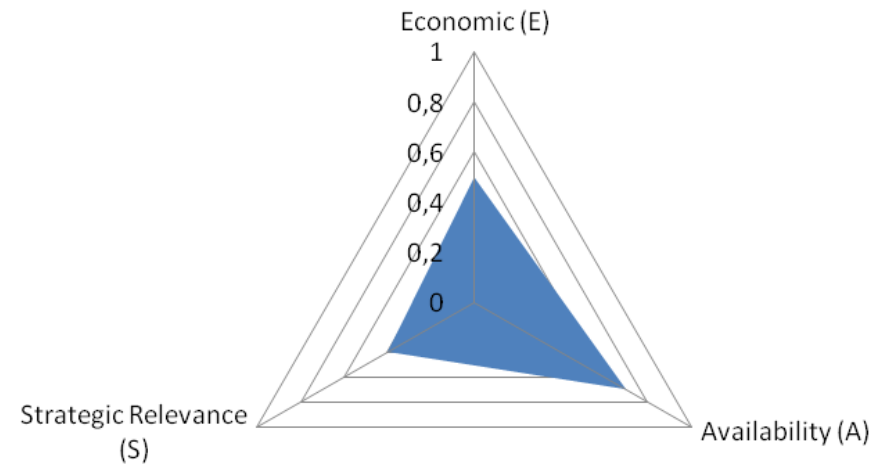


Methodology approach: process for the evaluation of Applications



Evaluation Outcome for Applications

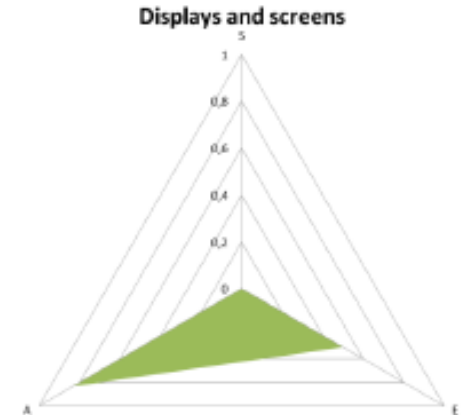
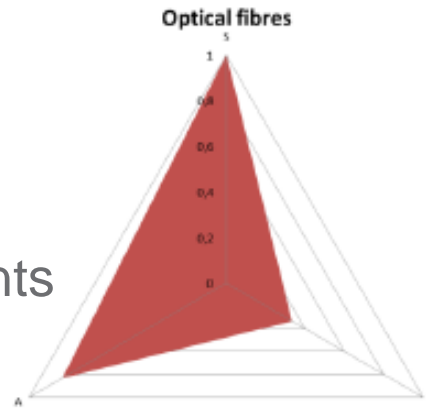
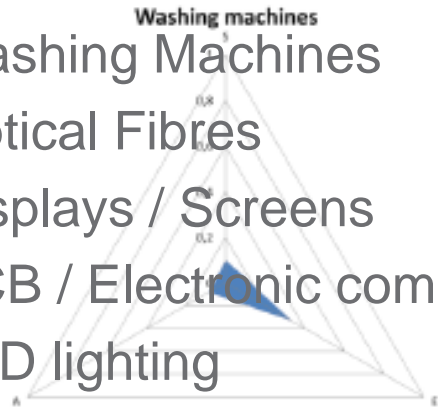
- Graphical representation permits to visualize:
 - radar graphs: direct visualization of the three criteria, normalized, to the single Applications
 - in bubble graphs: Comparative evaluation, showing in a single view the number of Jobs, risk of Availability and strategic relevance (the size of the bubble) to different Applications



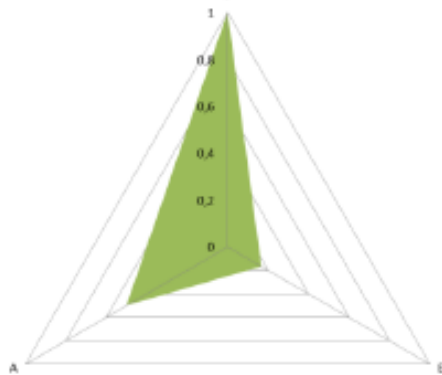
Outcome – ICT-Electric-Electronics

- ICT-Electric-Electronics Applications above threshold:

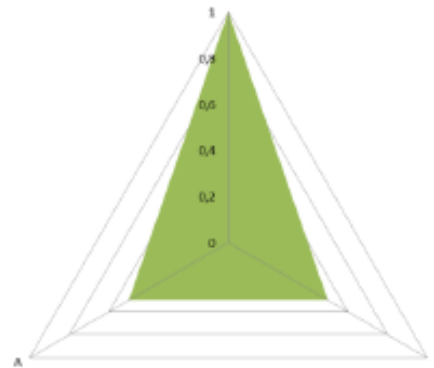
- Washing Machines
- Optical Fibres
- Displays / Screens
- PCB / Electronic components
- LED lighting
- MRI



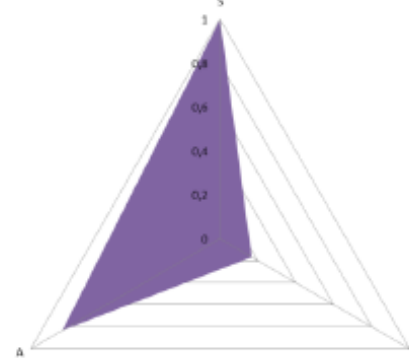
PCB basic production



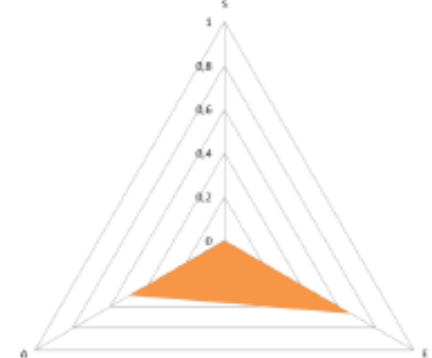
Electronic component production



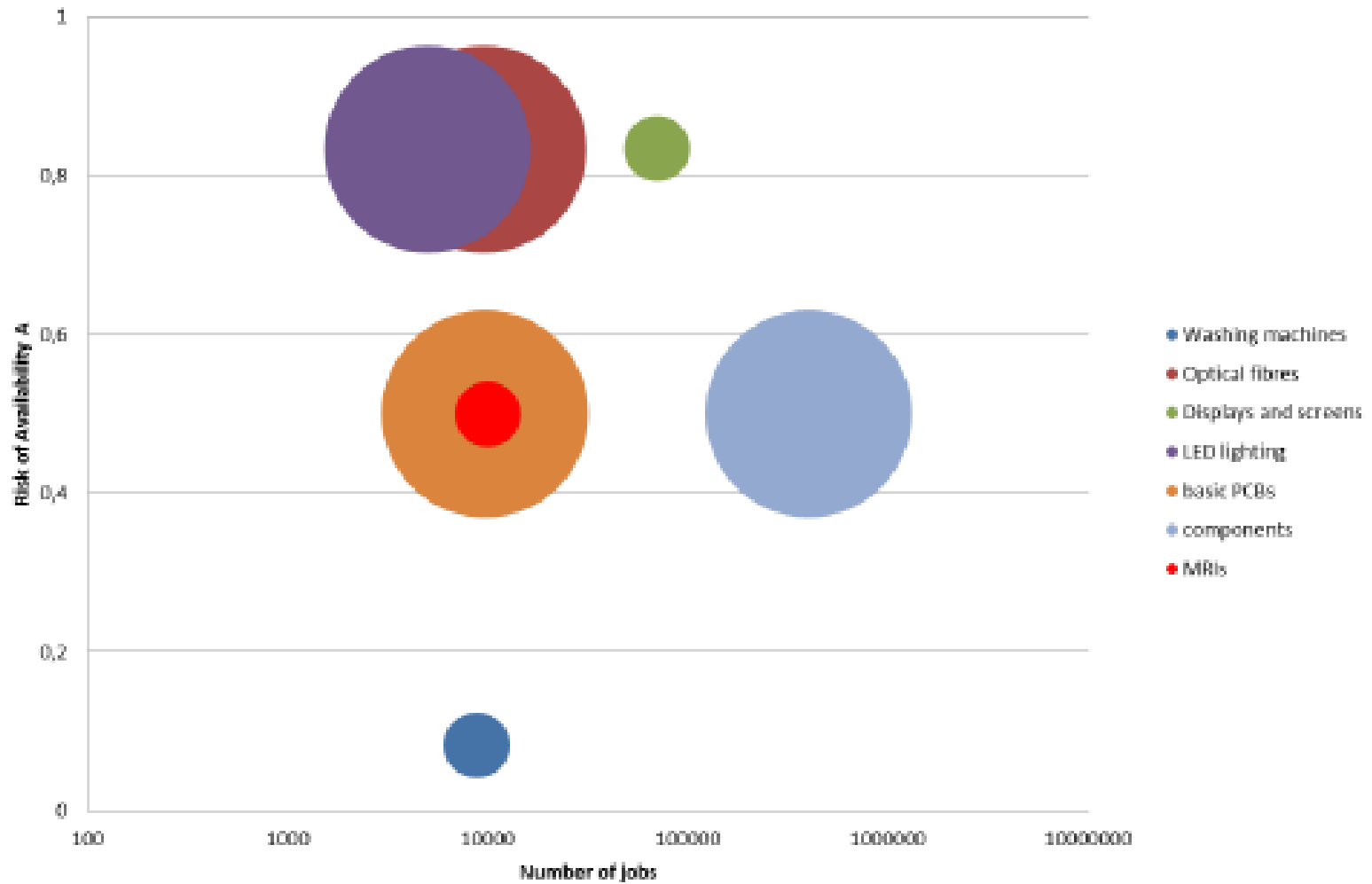
LED lighting



MRIs

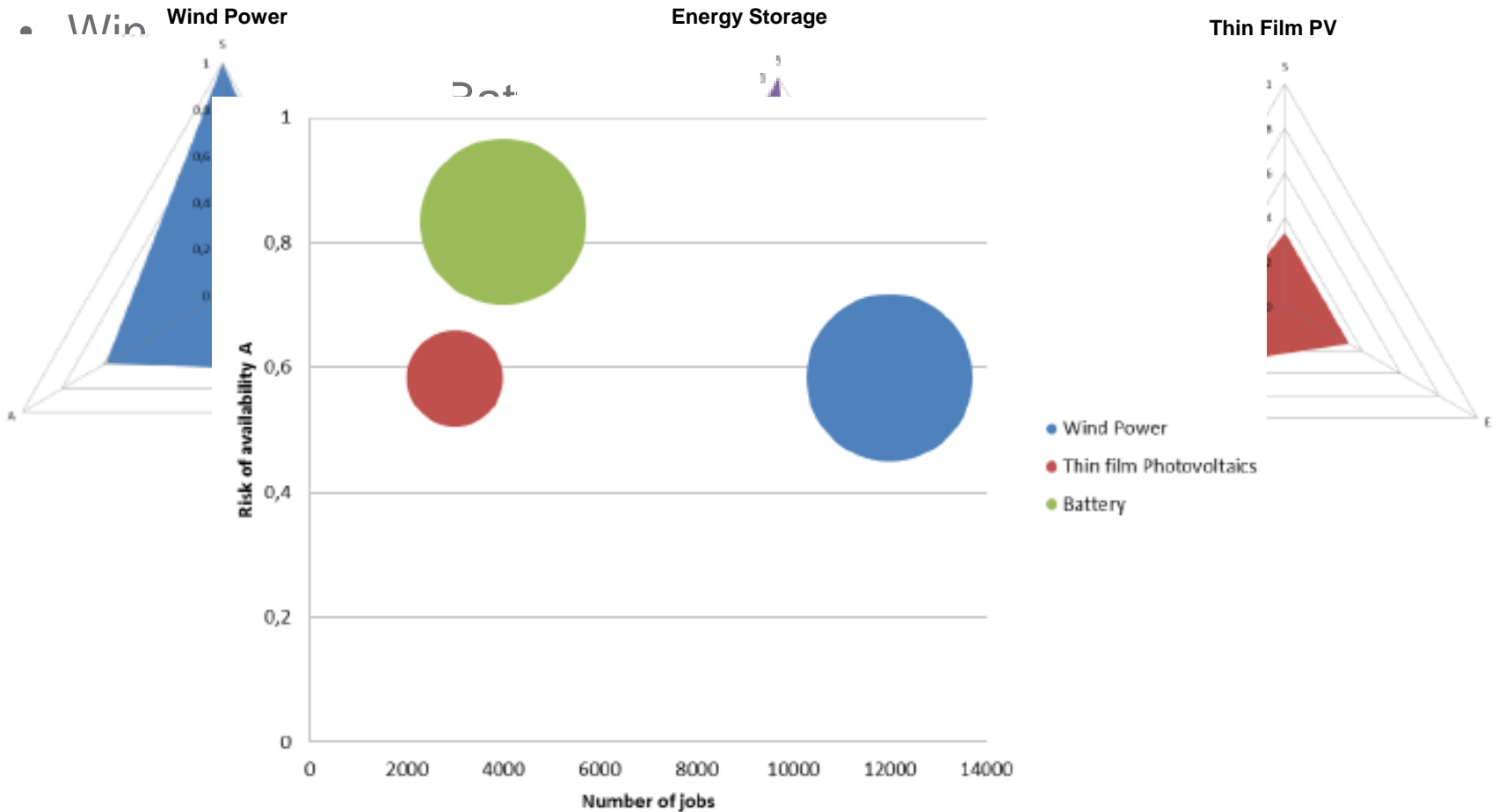


Outcome – ICT-Electric-Electronics

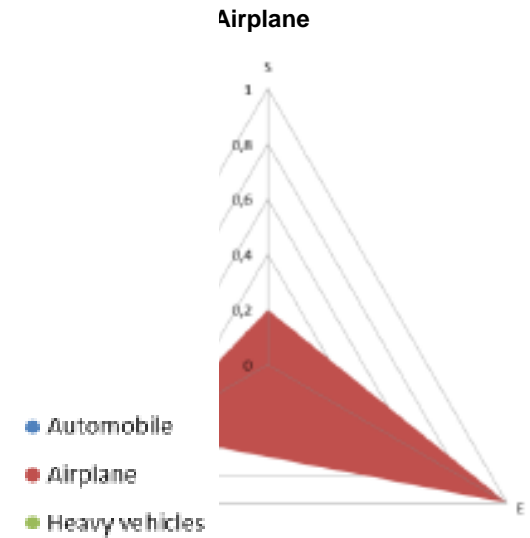
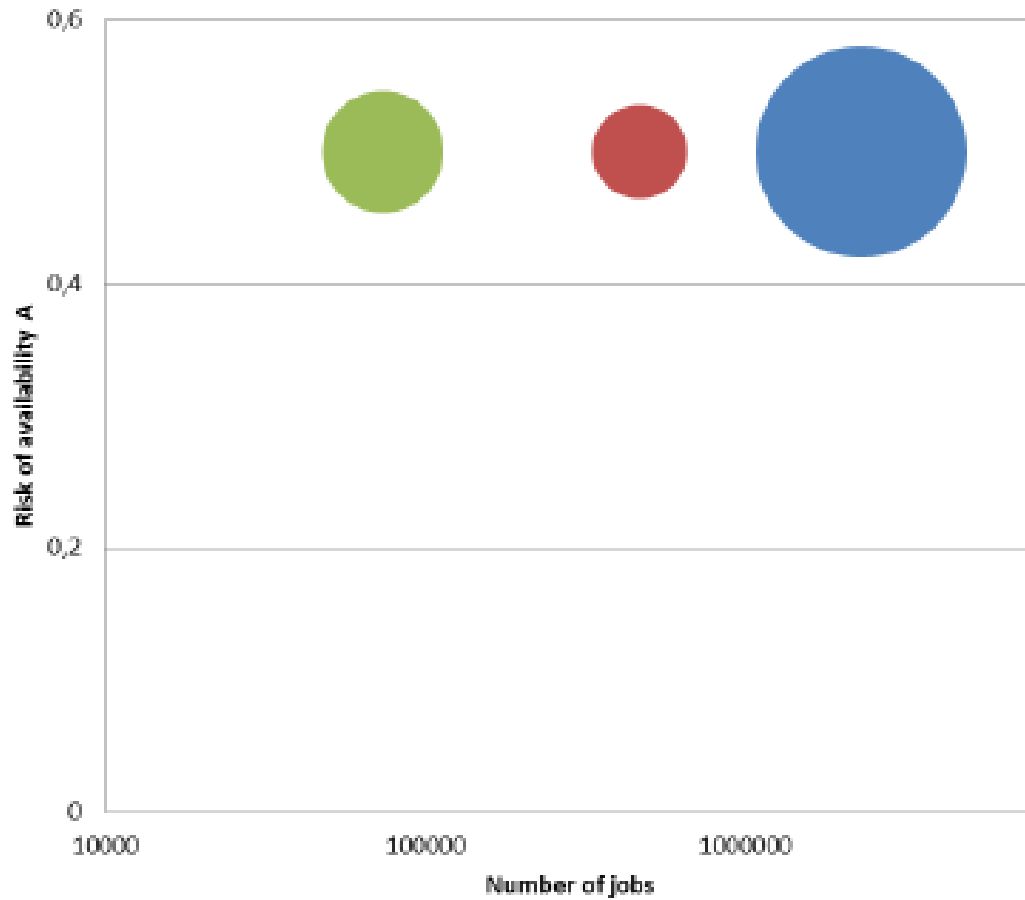


Outcome – Energy

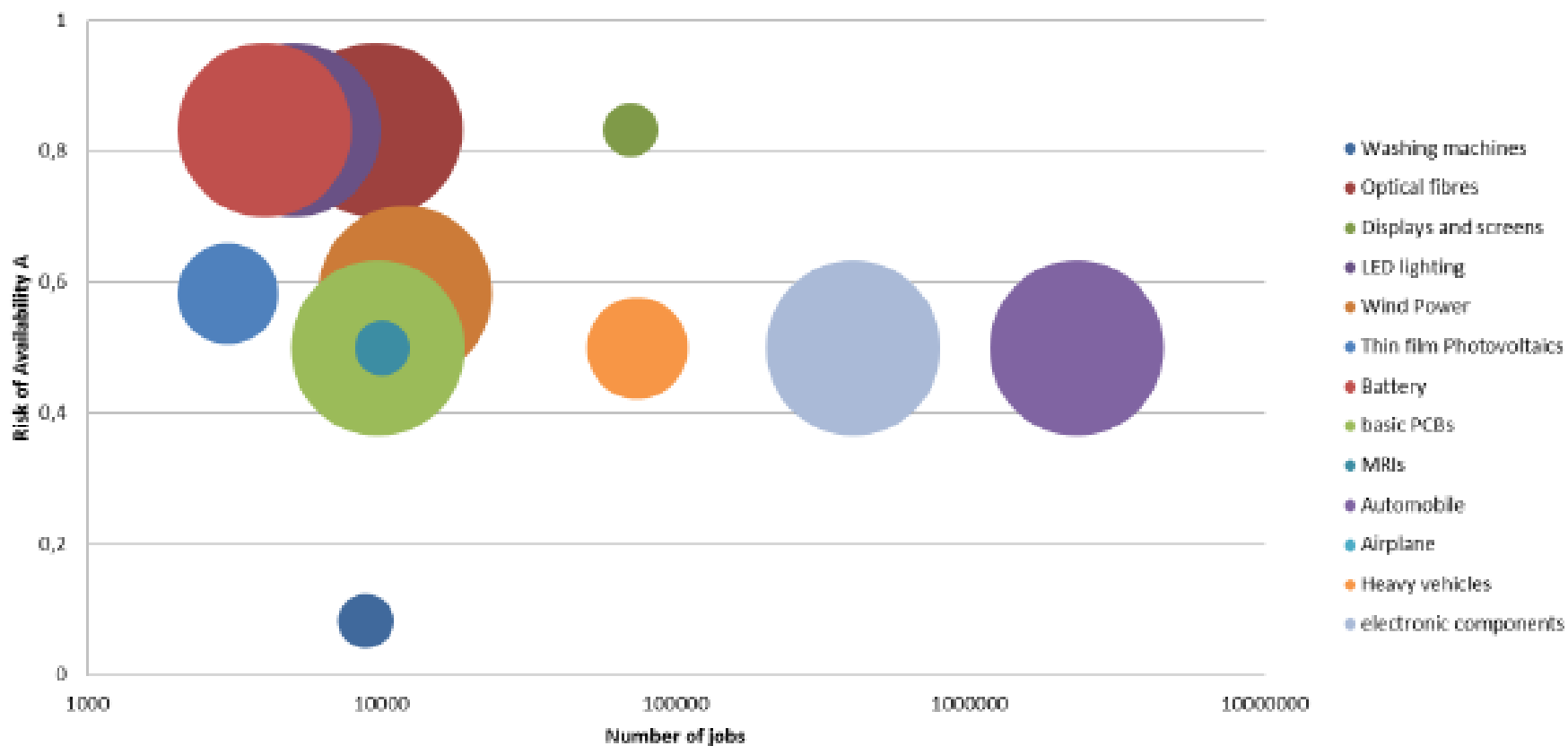
- Energy Applications above threshold:



Results / Outcome - Transportation



Results / Outcome - Global pictures



Results / Outcome - Global pictures

	S	E	A	Jobs
Washing machines	0	0.33	0.08	8,800
Optical fibres	1	0.17	0.83	9,500
Displays and screens	0	0.5	0.83	70,000
LED lighting	1	0.17	0.83	5,000
MRIs	0	0.67	0.5	10,000
PCBs	1	0.17	0.5	9,700
electronic components	1	0.5	0.5	400,000
Wind Power	1	0.67	0.58	12,000
Thin film Photovoltaics	0.3	0.33	0.58	3,000
Battery	1	0.17	0.83	4,000
Automobile	1	1	0.5	2,300,000
Airplane	0.2	1	0.5	466,900
Heavy vehicles	0.33	1	0.5	73,400

- Red Cells = Urgency for substitution roadmap to be developed
- Green Cells = Lower necessity to further roadmap

WP2 Conclusions

- Suggested priorities for further roadmapping, according to the prioritization process:
 - PCBs (incl. Components)
 - Permanent magnet based applications
 - Batteries and energy accumulators
 - High value – extreme applications alloys
 - Photonics: LEDs, fiber optics

- Thanks for the attention

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