



Supporting Circular Economy with IoT

Metropolia University of Applied Sciences
Mr. Anssi Ikonen



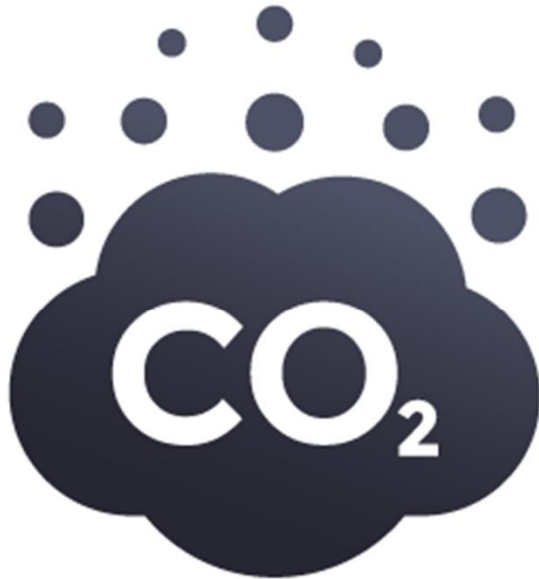
Fiare





Circular economy by 2050

- § The European Union has named the circular economy as one of the most important measures in achieving climate neutrality by 2050.
- § Finland is committed to developing the circular economy and it aims to become the leading country in the field in the coming decades.
- § Finland is lagging behind when it comes to harnessing the circular economy in the business world.
- § In Finland, the share of recycled materials in production was only 7 percent in 2018, while the average for the entire EU region was about 11 percent.



More than 272 million new laptops per year

- § IT industry contributing more than 2% of global CO2 emissions.
- § A new laptop produces on average 331 kgs of CO2 emissions during manufacture.^[1]
- § Lifespan of an average laptop create 422.5 kgs of CO2 emissions.
 - § Manufacturing: 331 kgs
 - § Shipping: 30 kgs
 - § Usage: 61.5 kgs (4 years)

In addition to the CO2 emissions, 190,000 liters of water and 1,200 kilograms of dirt must also be dug out and mined to get the resources needed.

[1] <https://circularcomputing.com/news/carbon-footprint-laptop/>

A use case for circular economy in Finland

- § Finnish legislation ensures free upper secondary education
- § Annual number of students starting high school is approximately 37 500
 - § Each student is provided by a free laptop
- § Estimated carbon footprint during the production of a laptop is estimated to 331 kgs

This equals to 12 400 000 kg of CO₂ emissions.

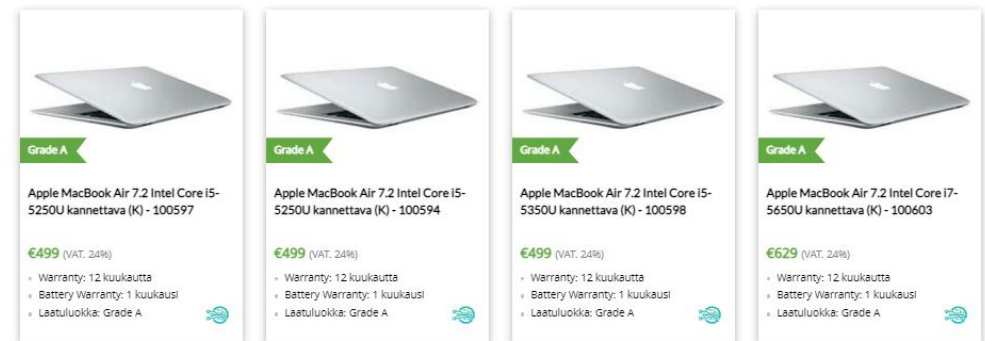
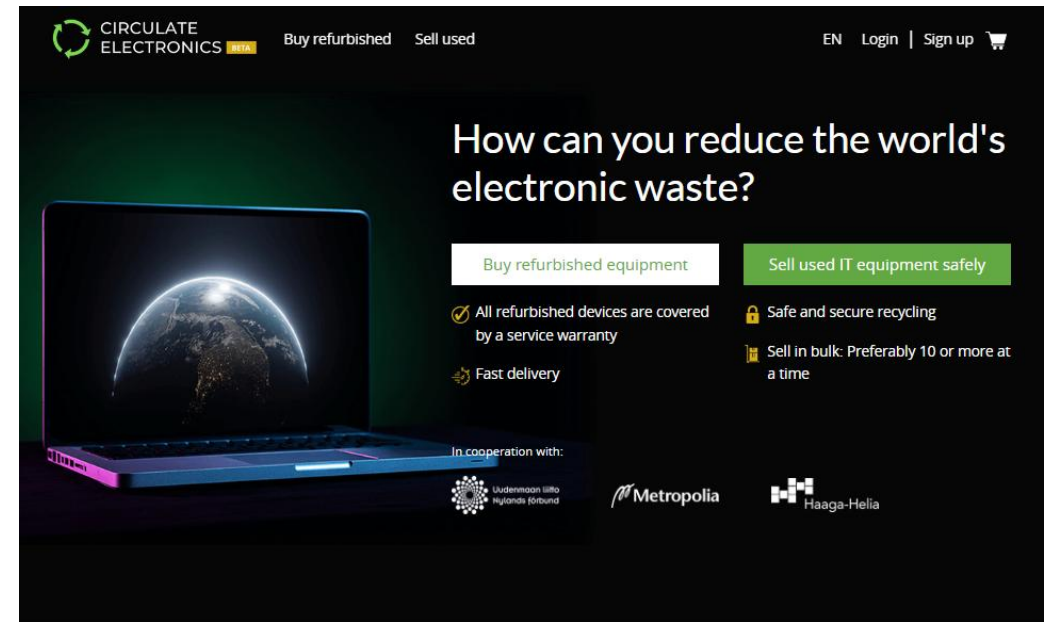


Annual CO₂ emissions of 8 580 cars in EU.^[1]

[1] <https://liikennefakta.fi/fi/ymparisto/henkiloautot/hiilidioksidipaastot>

Circular Economy Digital Marketplace (CEDIM)

- § The CEDIM project began in March 2021. It will end at the end of September 2022.
- § The digital marketplace called [Circular Electronics](#) remains online. After the project, Fiare Solutions take over the marketplace be responsible for its maintenance.
- § The most important objectives of the CEDIM project are to
 - § Research about requirements and opportunities of digital marketplaces for circular economy
 - § Increase knowledge and know-how on circular economy in higher education institutions and companies
 - § Pilot a digital marketplace for IT equipment called Circular Electronics
 - § Digital marketplace bring sellers, buyers, service providers and users together



| Model | Price (€) | Warranty | Grade |
|---|-----------------|--|---------|
| Apple MacBook Air 7.2 Intel Core i5-5250U kannettava (K) - 100597 | €499 (VAT, 24%) | Warranty: 12 kuukautta Battery Warranty: 1 kuukausi | Grade A |
| Apple MacBook Air 7.2 Intel Core i5-5250U kannettava (K) - 100594 | €499 (VAT, 24%) | Warranty: 12 kuukautta Battery Warranty: 1 kuukausi | Grade A |
| Apple MacBook Air 7.2 Intel Core i5-5350U kannettava (K) - 100598 | €499 (VAT, 24%) | Warranty: 12 kuukautta Battery Warranty: 1 kuukausi | Grade A |
| Apple MacBook Air 7.2 Intel Core i7-5650U kannettava (K) - 100603 | €629 (VAT, 24%) | Warranty: 12 kuukautta Battery Warranty: 1 kuukausi | Grade A |

https://circulate-electronics.com/?hl=en_GB

Companies' Roles in the Circular Electronics Pilot

Company A (seller)

- § Reports old devices to the marketplace
- § Provides basic information about the used devices to the marketplace
- § Chooses the data security level needed to erase the data before selling the devices

Digital marketplace

- § Accepts sales announcements from Company A
- § Function as a broker for sales and purchases
- § Provides needed documentation for the customer
- § Direct the used product to suitable partners based on information

Service provider

- § Receive notifications about available devices from the marketplace
- § Organizes the needed logistics for devices they wanna resell
- § Performs the agreed data security measures
- § Maintains the devices in salable condition
- § Announces the devices for sale on the marketplace

Company B (buyer)

- § Receives information about the devices on offer
- § Chooses the devices suitable for their needs and place an order.
- § Buys and receives the devices they ordered and the documents needed (warranty etc.)

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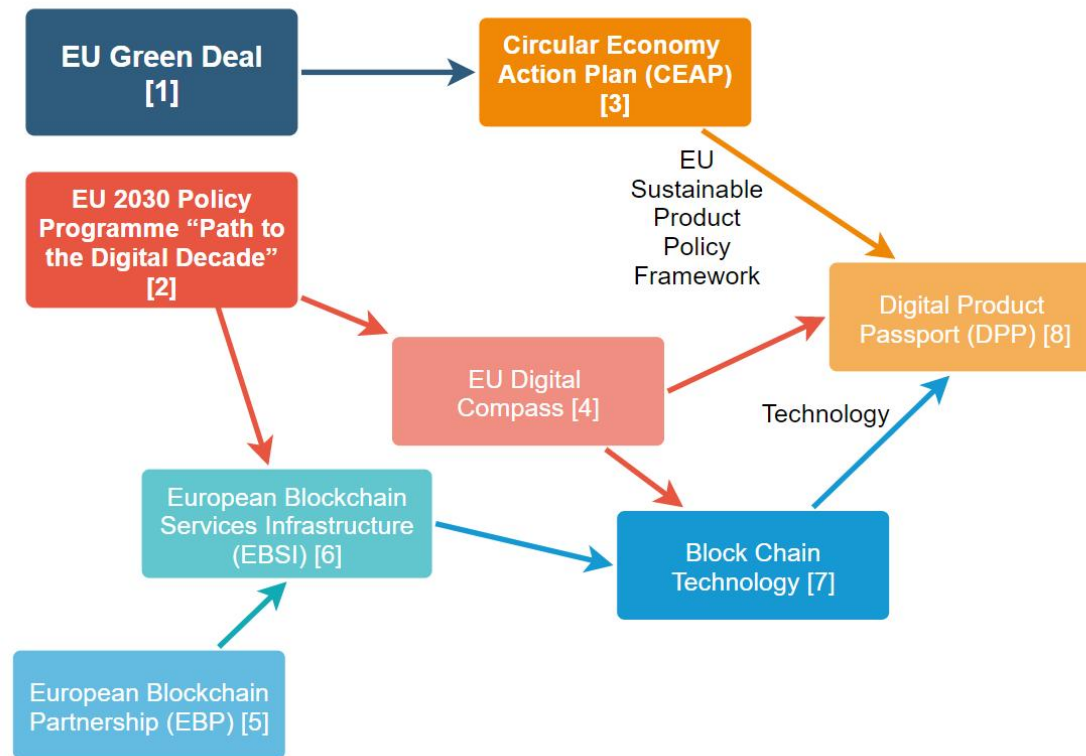
Digital marketplace

- § Accepts sales announcements from Company A
- § Function as a broker for sales and purchases
- § Provides needed documentation for the customer
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§ Digital Product Passport (DPP)

§ European Blockchain Services Infrastructure (EBSI)

EU's Green Path to Circular Economy and supporting technological solutions



References on the last page of the presentation.

Digital Product Passport



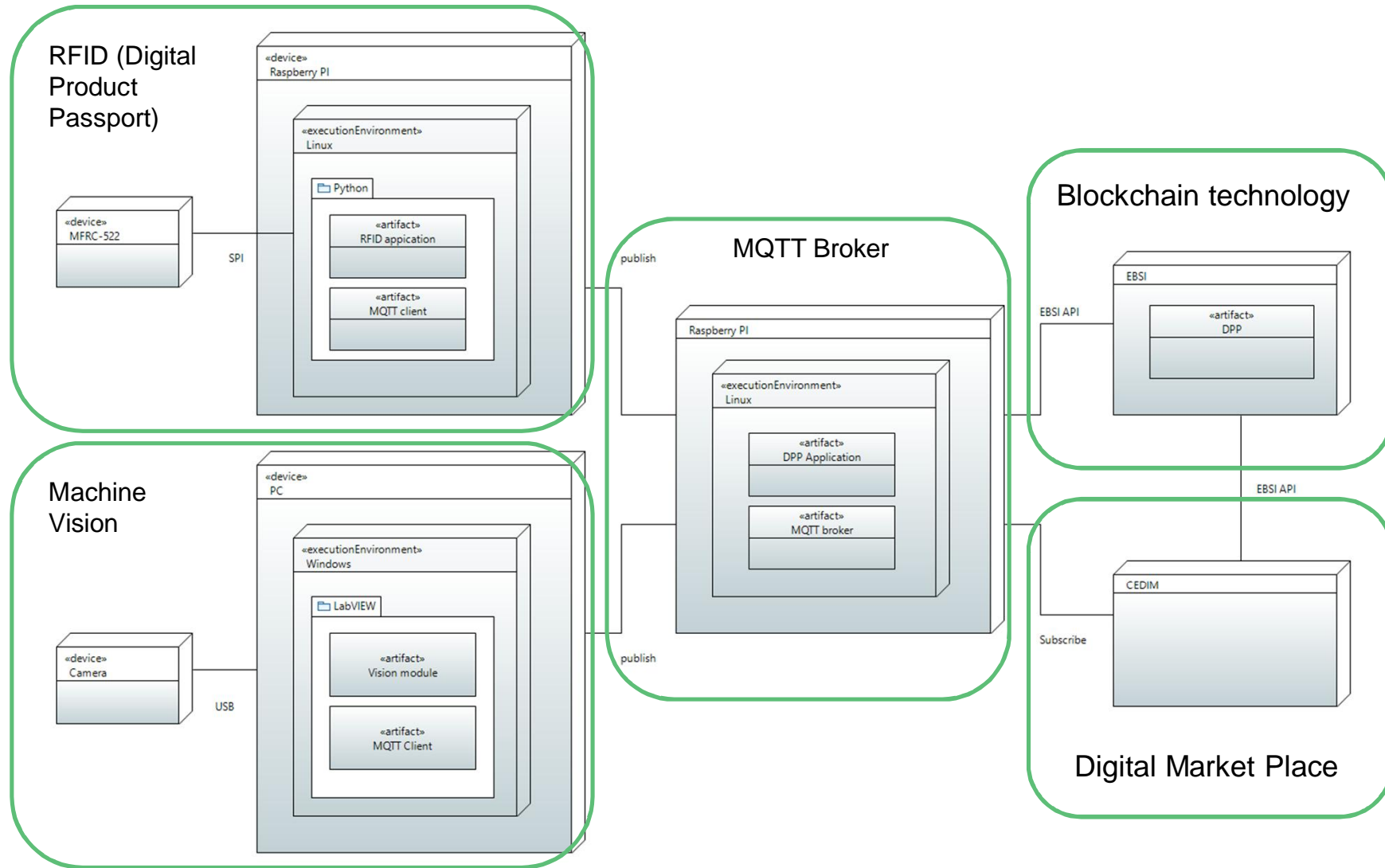
Under the new regulation, the product passport shall:

- ensure that actors along the value chain, including consumers, economic operators, and competent national authorities, can access product information relevant to them
- improve traceability of products along the value chain
- facilitate the verification of product compliance by competent national authorities
- include the necessary data attributes to enable the tracking of all substances of concern throughout the lifecycle of the products covered

<https://www.gs1.eu/news/eu-digital-product-passport-revealed-time-to-act>

IoT Pilot

§ Automated system to report electrical devices to digital market place



The Circular Electronics Pros and Cons

| PROS | CONS |
|---|--|
| Extending the life cycle of IT equipment saves the environment and at the same time it is also a more affordable solution the businesses. | Businesses are quite suspicious of the used IT equipment. They might need some convincing in order to sell old or buy used IT equipment. |
| Lots of supply. One third of the large organizations scrap or store their old IT devices avg. every four years. | Requires a lot of marketing from the platform administrators. |
| Easy to use. Passing functioning devices from company to another. No additional costs for seller. | The effect of the age of IT equipment to usability and reliability in consumer use can in some cases be somewhat unpredictable. |
| A perfect platform for start-ups to acquire high-class IT equipment at a decent price. | |

References

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- § [2] Path to the Digital Decade, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0574>
- § [3] Circular Economy Action Plan (CEAP), https://eur-lex.europa.eu/resource.html?uri=cellar:9903b325-6388-11ea-b735-01aa75ed71a1.0017.02/DOC_1&format=PDF
- § [4] EU Digital Compass, <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52021DC0118>
- § [5] European Blockchain Service Infrastructure (EBSI), <https://digital-strategy.ec.europa.eu/en/news/european-blockchain-pre-commercial-procurement>
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- § [7] Blockchain Now and Tomorrow, JRC Publications Repository, <https://publications.jrc.ec.europa.eu/repository/handle/JRC117255>
- § [8] Digital Product Passport (DPP), https://environment.ec.europa.eu/publications/proposal-ecodesign-sustainable-products-regulation_en, p.54, article 8