

# Open Source for sustainable electronics



#### **How it started**











14,497 of 25,000 Fairphones sold

**ROAD MAP** SHARE **BUY NOW PHONE STORY** CONTACT FAQ BLOG A seriously cool smartphone Ø ♥ ▼ # 65 23 that puts social ₩ 07:15 values first MONDAY See why it's fair THAW Technical specifications





Fairphone 1 2013



Fairphone 2 2015



**Fairphone 3** 2019



Fairphone 3+ 2020



Fairphone 4 2021



#### **Our Mission**

By establishing a market for ethical electronics, we motivate the industry to act more responsibly.

#### **Our Theory of Change**

We want to raise awareness of the story behind your mobile phone by uncovering the complex supply chains behind electronic products.

Our mission is to set an example for the tech industry, showing them that it is possible to produce electronics more ethically and be commercially successful.



#### **4 Impact Areas**

**Fair materials Long-lasting Fair factories** Re-use & design recycling

#### We use the Life Cycle Analysis (LCA) method

To evaluate the **environmental impact** of a **product** through its **life cycle** 

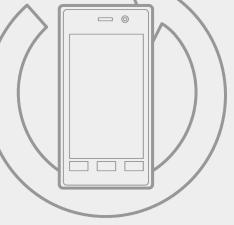
NOT only the carbon footprint (Water, Eco Toxicity, Abiotic depletion, ...)



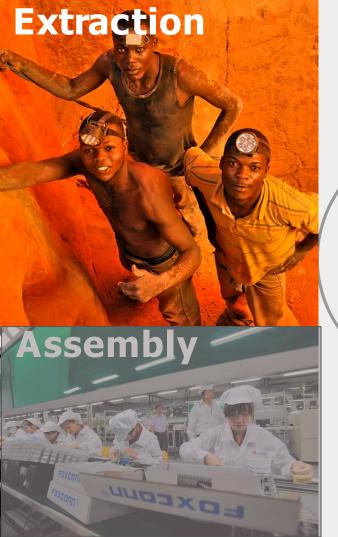
75% of the total impact of a smartphone caused by the production phase



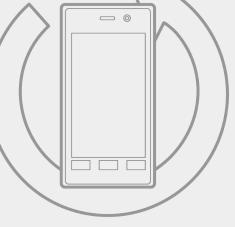
## Life Cycle

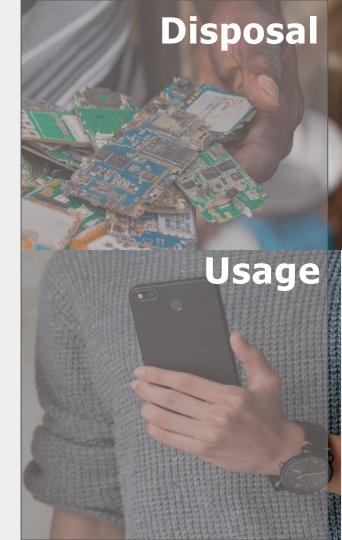






# Life Cycle



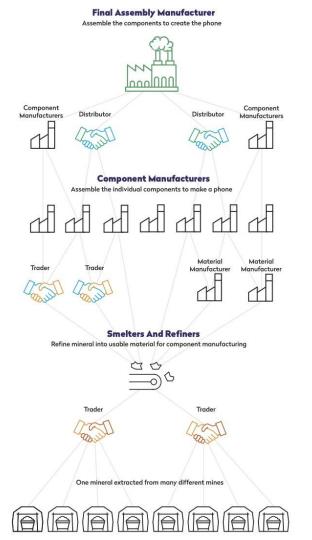


## Complexity of the supply chain

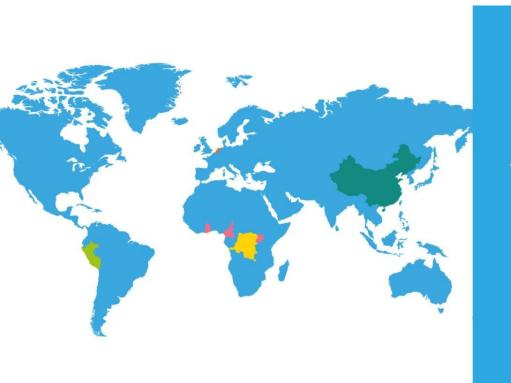


The map below tracks the journey of tin and tantalum used in the Fairphone 1 Follow the minerals on their international route from the mine site to the factory.

**FAIRPHONE** 



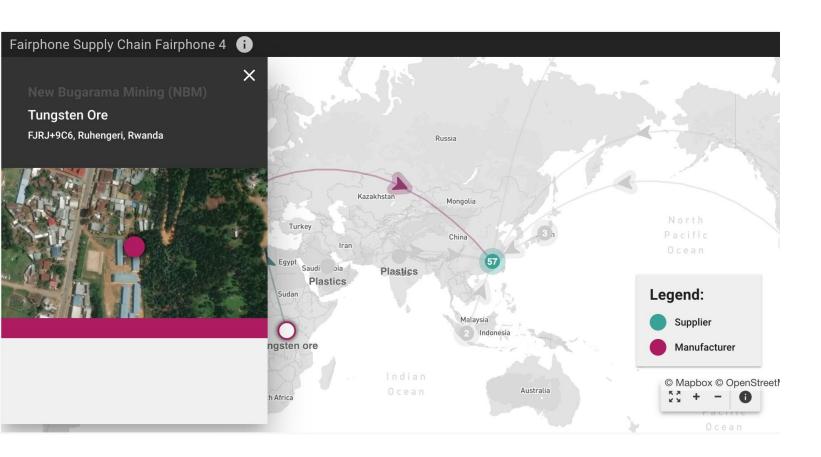
# Decomplexify the supply chain



# Mapping the journey of your Fairphone

Before you can improve the electronics supply chain, you have to understand how it works. Step by step, we're uncovering the materials, suppliers and locations that play a role in making the Fairphone 4. Because the more we know, the better we can identify and implement positive changes.





### Supply Chain Engagement: from Risk to Impact

Fairphone 4 Suppliers, Smelters and Refiners

# We open source all our supply chain

#### FAIRPHONE

Semiconductors - Integrated Circuits, Discretes, LEDs

| Tier | Supplier  | Address: Manufacturer   | Website                                 |
|------|---|---|---|
| 2    | Shanghai Weier Semiconductor Ca., Ltd.                          | Headquarters: 2F, No.88, ShangKe<br>Road, Pudong District, Shanghai<br>201210, China                                | www.omnivision-group.com/#/<br>home     |
| 2    | JCET Group Co., Ltd.  | Manufacturer: 275 Middle Binjiang<br>Road, Jiangyin, Jiangsu, China   | www.vanchip.com                         |
| 2    | Taiwan Semiconductor Manufacturing (TSMC)                       | Manufacturer: 9, Ctreation Road,<br>Hsinchu<br>Science Park, Hsinchu, 30077, Taiwan                                 | www.pixelworks.com                      |
| 2    | Unisem  | Manufacturer: No. 8-2 Kexin Road,<br>High-Tech West Zone, Chengdu,<br>Sichuan, China                                | www.sg-micro.com                        |
| 2    | Samsung Electronics   | Manufacturer: 1, Samsung jeonja-ro,<br>hwaseong-si, Gyeonggi-do 445-330,<br>Korea                                   | www.samsung.com                         |
| 2    | Tianjin Samsung Electro-Mechanics co.Jtd.                       | Manufacturer: No.80 Xiaqing Road,<br>Western Area of Economic-<br>Technological Development Area,<br>Tianjin, China | www.product.samsungsem.com/<br>index.do |
| 2    | Suzhou ASEN Semiconductors Co., Ltd.                            | Manufacturer: 188 Suhong Middle<br>Road, Suzhou, Jiangsu, China   | www.maxscend.com                        |
| 2    | Moda-Innochips  | Manufacturer: 42-7, Dongsan-Ro 27<br>Beon-Gil Wonsi-dong Danwon-Gu,<br>Korea  | www.innochips.co.kr/en/                 |
| 2    | RF360   | Manufacturer: 166 Kallang Way,<br>Singapore   | www.qualcomm.com                        |
| 2    | Qualcomm Technologies,Inc                                       | Headquarters: 5775 Morehouse Dr.San<br>Diego CA 92121, United States  | www.qualcomm.com                        |
| 2    | Taiwan Semiconductor Manufacturing Co. LTD                      | Headquarters: 8, Li-Hsin Rd. 6,<br>Hsinchu Science Park, Hsinchu<br>300-78, Taiwan, R.O.C.                          | www.tsmc.com                            |
| 2    | TSMC (China) Co. LTD  | Headquarters: 4000 Wen Xiang Road,<br>Songjiang, Shanghai, China  | www.tsmc.com                            |
| 2    | Shanghai Huahong Hongli<br>Semiconductor Manufacturing Co., LTD | Manufacturer: China (Shanghai) Pilot<br>Free Trade Zone, Pudong, Shanghai,<br>China                                 | www.huahonggrace.com                    |
| 2    | Glofonde Semiconductor Co., LTD                                 | Headquarters: 15 / F, Block B, China<br>Railway Nord International Center,<br>908 Xiuwen Road, Minhang District,    | www.awinic.com                          |

Shanahai, China

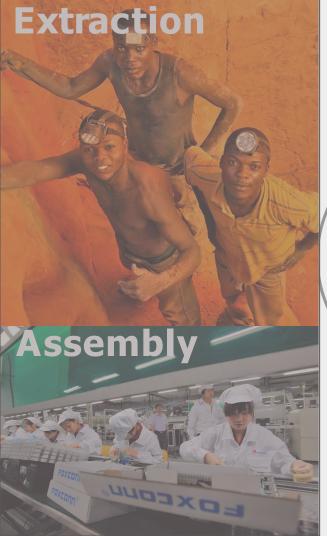
Motivate the Industry

#### **Our Theory of Change**

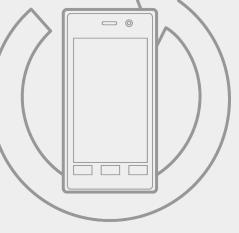
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# Life Cycle





# Longevity



**Modular smartphones** 



Long term software support



#### **Advanced modularity**

All the Fairphone models since Fairphone 2 are modular phones, consisting of different pieces.

The modules can all be easily repaired or replaced.



Repairability: 10 / 10

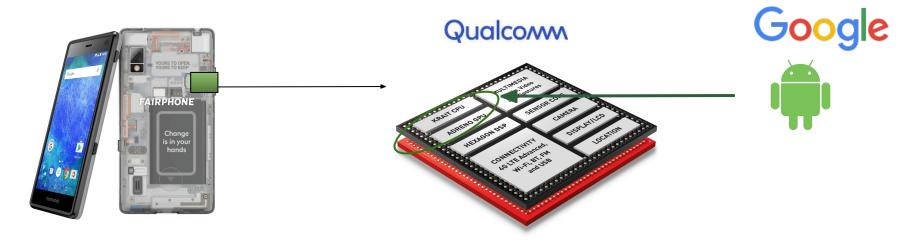




#### Long-term software support

20% of users change their smartphone because of lack of software support.

Why it is so difficult to do software updates in the mobile industry?



Chipset



Fairphone 2 2015

Four major upgrades

Still updated in 2022



Fairphone 3 2019



Fairphone 3+ 2020



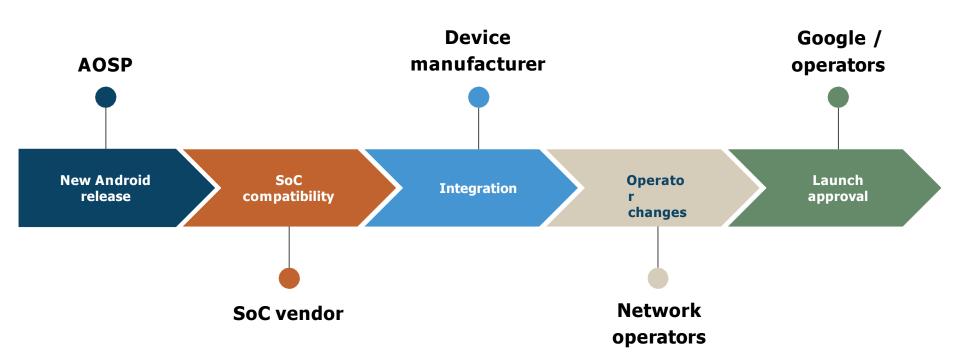
Updates until 2024 guaranteed



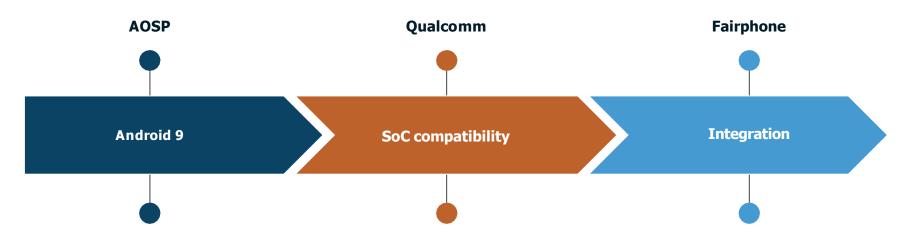
Fairphone 4 2021

Updates until 2026 guaranteed

#### **Bringing Android to a Device** Overview



### Bringing Android to a Device Example of Fairphone



#### Phase 1 AOSP release

- Android Open Source Project
- Driven by Google
- Source code freely available
- Primarily licensed under the Apache license

#### **Phase 2** SoC compatibility

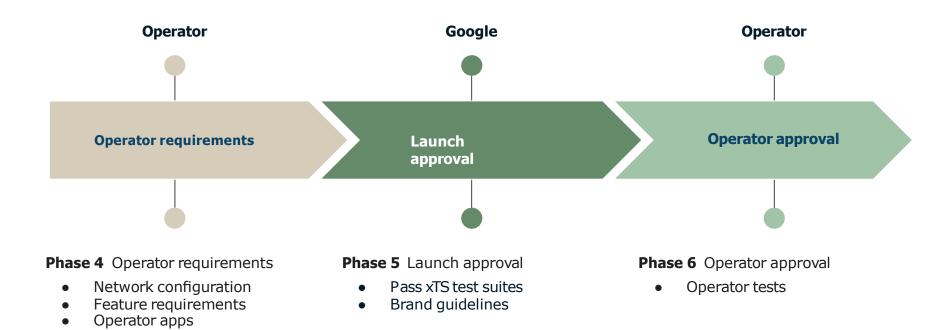
- System-on-a-chip
- AOSP modifications released as open source through the Code Aurora Forum (CAF)
- Proprietary code for closed components (modem, ...)

#### Phase 3 Integration

- Hardware bringup
- Integration of proprietary Google Mobile Services (GMS)
- Integration of special components (camera, ...)
- Testing/QA
- Fairphone responsible

#### **Bringing Android to a Device** Example of Fairphone 3

To be done by Fairphone



#### (Security) Maintenance Releases

Example of Fairphone 3 - Launched with Android 9 in 2019

| Google            | Provides security patches and other fixes                             |
|-------------------|---|
| Qualcomm          | Provides security patches and other fixes                             |
| Network operators | Provide configuration and app updates                                 |
| Fairphone         | Integrates patches from all other parties, including additional fixes |

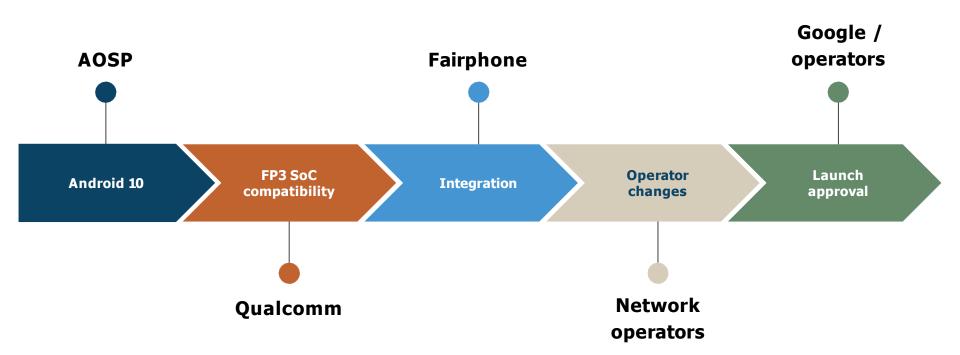
#### (Security) Maintenance Releases

Example of Fairphone 3 - Android 9 (EOL Android 9:2021)

| Google            | Provides security patches and other fixes                             |
|-------------------|---|
| Qualcomm          | Provides security patches and other fixes                             |
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#### **Maintaining Android**

Example of Fairphone 3 - upgrade to Android 10 (2020)



#### (Security) Maintenance Releases

Example of Fairphone 3 - Android

10 Provides security patches and other fixes Google Provides security patches and other fixes Qualcomm Provide configuration and app **Network operators** updates **Integrates patches from all other Fairphone** parties, including additional fixes

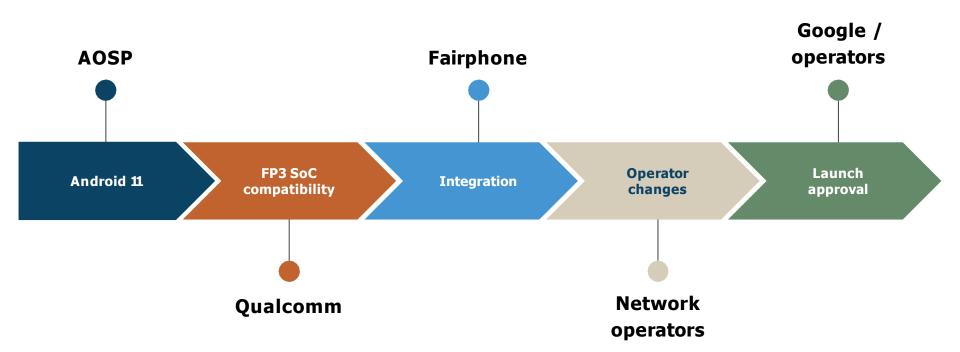
#### (Security) Maintenance Releases

Example of Fairphone 3 - Android 10 (EOL Android 10:2022)

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#### **Maintaining Android**

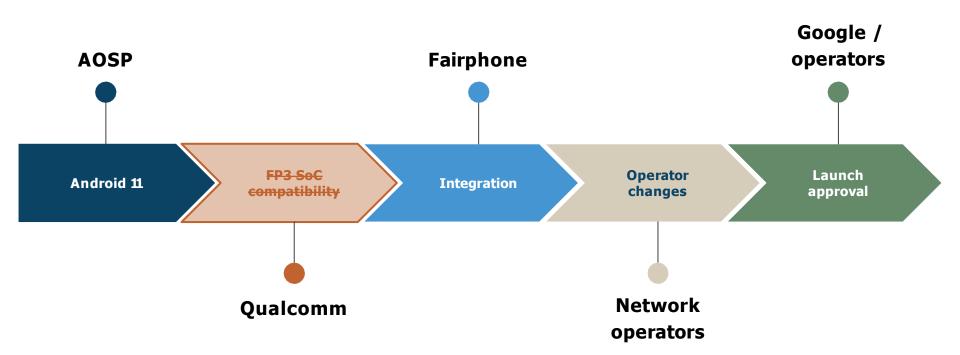
#### Example of Fairphone 3 - upgrade to Android 11

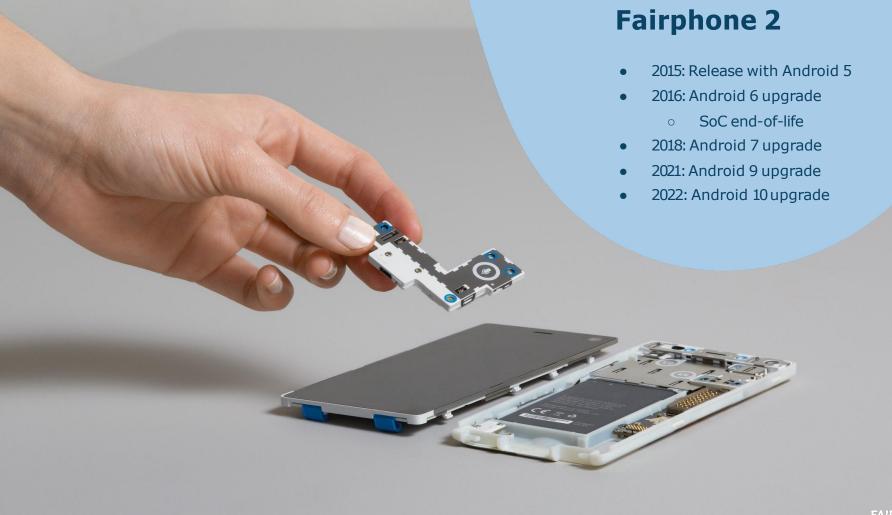


#### (Security) Maintenance Releases Example of Fairphone 3 - Android 11

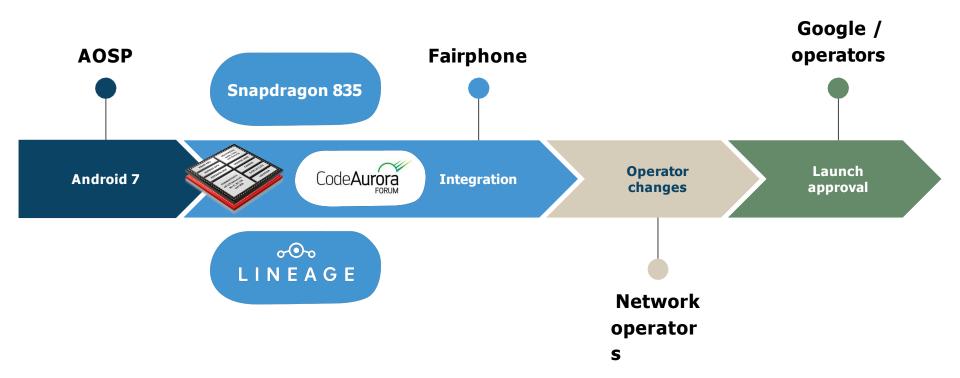
| Google            | Provides security patches and other fixes                             |
|-------------------|---|
| Qualcomm          | Provides security patches and other fixes                             |
| Network operators | Provide configuration and app updates                                 |
| Fairphone         | Integrates patches from all other parties, including additional fixes |

#### **Maintaining Android** - upgrades





## Example of Fairphone 2 Android 7 upgrade How we did it



## Android 10 is coming to the sixyear-old Fairphone 2

And the Fairphone 3 is getting Android 11

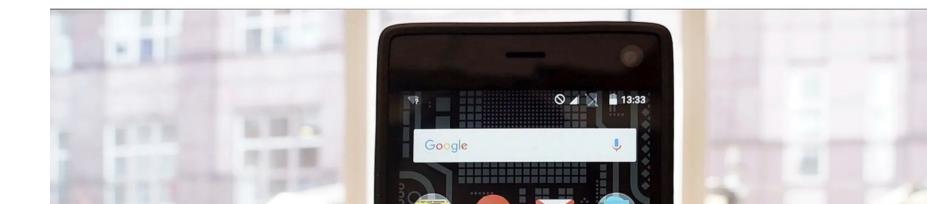
By Jon Porter | @JonPorty | Nov 23, 2021, 10:39am EST

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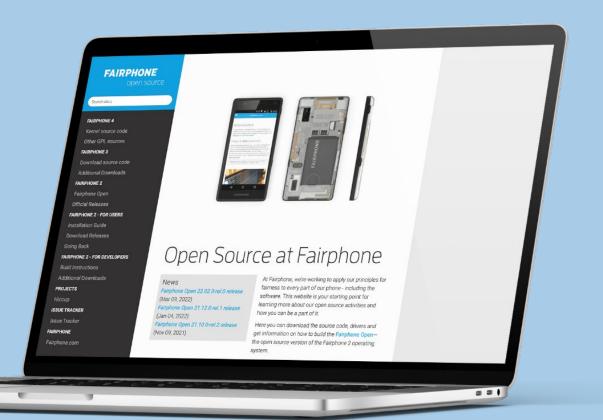




#### **Fairphone Open Source platform**

Share Build Contribute

code.fairphone.com









#### Fairphone 2 is on its way to have 8,5 years of SW support...

#### **FAIRPHONE**















#### **ABOUT**

We are sick of not receiving updates shortly after buying new phones. Sick of the walled gardens deeply integrated into Android and iOS. That's why we are developing a sustainable, privacy and security focused free software mobile OS that is modeled after traditional Linux distributions. With privilege separation in mind. Let's keep our devices useful and safe until they physically break!

Where can I download the latest release? >

Which devices run postmarketOS? >

How do I port my device? >

Privacy also matters



# Vos données sont VOS données!

Nous construisons des systèmes d'exploitation pour smartphones désirables, open source, respectueux de la vie privée.

Téléchargez et installez

Achetez un smartphone Murena avec /e/OS



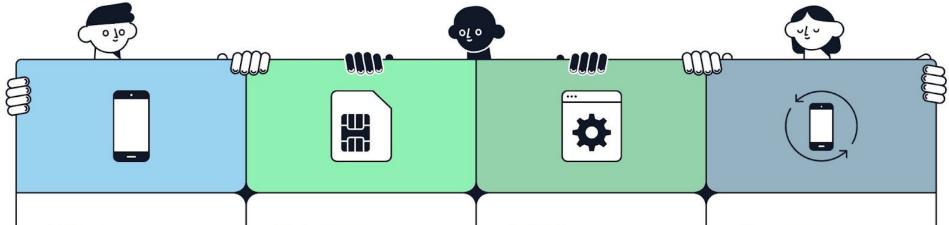
### Fair\*TEC

Et si vous preniez part au numérique du monde d'après?

Découvrir nos offres



#### Fair♦TEC



#### Fairphone

détachées.

Un smartphone durable, produit dans des conditions respectueuses des Hommes et de la planète et facilement réparable de part sa conception et la disponibilité des pièces

#### TeleCoop

Un opérateur télécom coopératif qui vous permet de ne payer que les données mobiles que vous consommez réellement pour reprendre la main sur votre consommation mobile.

#### /e/OS

Un système d'exploitation opensource, respectueux de votre vie privée et interopérable avec vos applications mobiles habituelles.

#### Commown

Un service coopératif de location de matériel électronique. Commown ne vendra jamais ses Fairphone et fera donc tout pour les réparer et les (re)louer le plus longtemps possible.

# #techdiscernment



#### Le cuiseur passif open source de Barilla vous aide à cuire vos pâtes en consommant moins d'énergie

-O- Nicolas Lecointre, commit du 7 Nov 2022

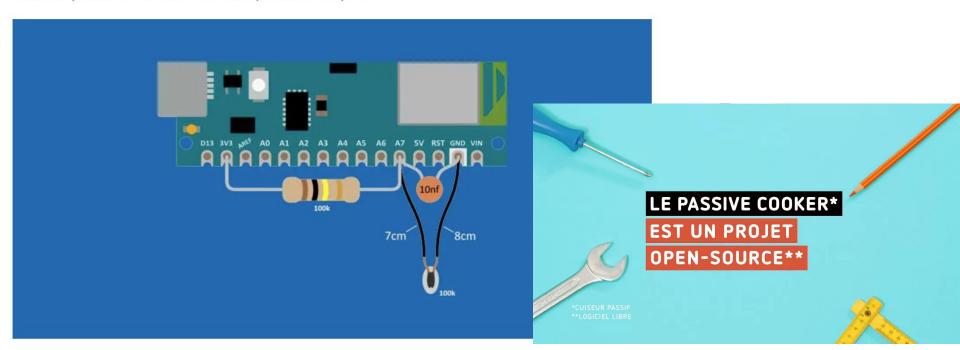
# Cet article comporte un lien affilié (Amazon)



**Arduino** *al dente* — La marque Barilla a mis au point un dispositif open source qui permettrait de réduire la consommation d'énergie et les émissions de CO2 de 80% pour la cuisson de vos pâtes.

L'objet connecté repose sur une carte Arduino et ses instructions de montage et de configuration sont mis à disposition par Barilla sur son site. L'appareil, composé d'un boîtier imprimable en 3D (avec du plastique résistant à une température de 150°C), d'une carte <u>Arduino Nano 33 BLE</u> et d'un capteur de température, fonctionne sur piles et avec une application mobile dédiée, développée par l'équipe IT de la marque.

La marque met à disposition sur son site les sources permettant de reproduire le boîtier à l'aide d'une imprimante 3D, ainsi que les instructions d'assemblage du cuiseur passif et la liste des composants requis.





#### The Hippocratic License



#### Hippocratic License 3.0 (HL3): An Ethical License for Open Source Communities

Technological advancement is often shaped by the choices and priorities of the powerful — in particular, the military, governments, and corporate interests. Their distorted priorities are often at odds with the promise of technology as a force for promoting justice and equity worldwide , and this increasingly includes open source technologies.

Traditional open source is based on the <u>flawed premise that technology is</u> <u>fundamentally neutral</u> , and that <u>unrestricted access to source code</u> — even for <u>explicitly "evil" purposes</u> — is in fact an unqualified good. But around the world, open source developers are starting to realize that the software that they create, with its tremendous potential to change the world for the better, is also being abused to sustain and promote systems of inequity and injustice, globally, and at unprecedented scale.

#### **#TechDiscernment**

Open source doesn't make a project responsible... but open source is a lever for a responsible project

#### **FAIRPHONE**

# Open source for Ethical software for phones that last



"If you Ğhinfi you're Ğo small Ğ have an impacĞ Ğy going Ğ bed wiĞh a mosquiĞo in Ğhe room."

**Anita Roddick**