PATENT INVENTION : INITIATION AND PRINCIPLES

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EDF
CHANGER L'ÉNERGIE ENSEMBLE

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- **Patent terminologies**
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PATENT WOR(L)D(S)

CHANGER L'ÉNERGIE ENSEMBLE

INTELLECTUAL PROPERTY

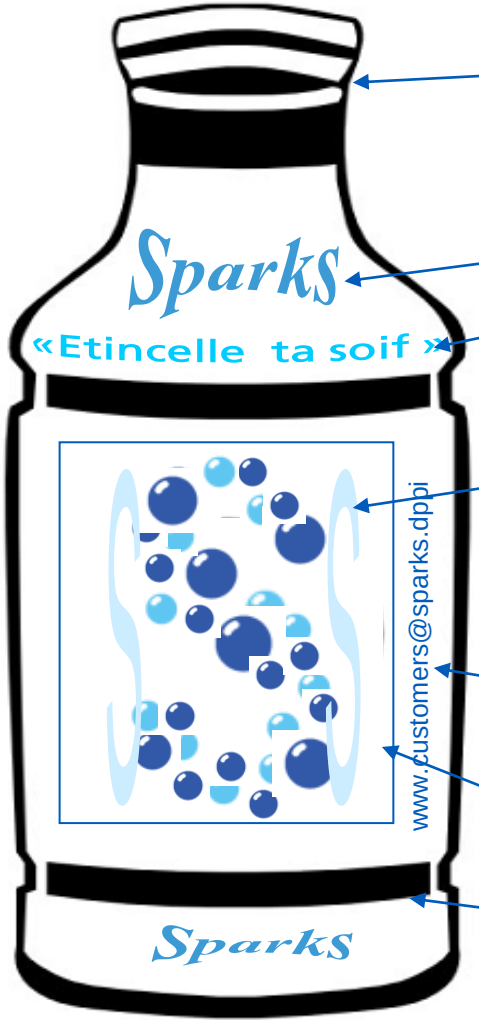
ARTISTIC AND LITERARY PROPERTY

- **Copyright (including Software Code)**
- **Related rights**
  - **performers' rights**
  - **rights of producers of phonograms or videograms**
  - **database rights**

INDUSTRIAL PROPERTY

- **Patents**
- **Know-How**
- **Designs (including graphic interfaces)**
- **Trademarks**

A “Simple” product may hide different kinds of protection
Basic example : *‘Sparks'*



■ **PATENTS**
- Bottling process patent + **Software**
- Anti-drip closure/opening patent

■ **TRADEMARK**
- A brand/Sign
- Slogan

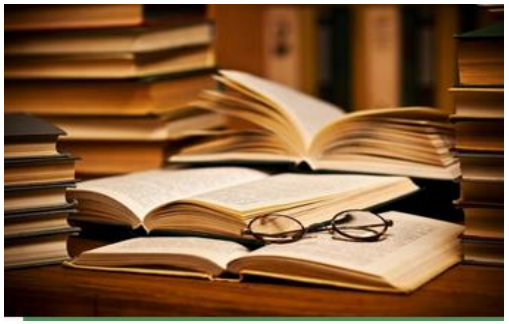
■ **COPYRIGHT**
- Picture

■ **DESIGNS**
- Bottle shape

■ **INTERNET DOMAIN NAME**
- @sparks.dppii

■ **KNOW-HOW (manufacturing process)**
- Self-adhesive label
- Beverage production process

SOME FIGURES



- Source of Technical Information (prior art worldwide)
  - 70% of citations are in patents
  - 40% of solutions only in patents!

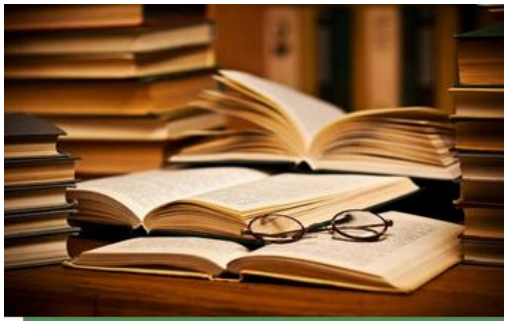
Numbers of patent application per year

	2000	2010	2020	2021	Increase rate (%) over 10 years (2010-2020)
China	25346	293066	1344817	146644	458,9
USA	164795	241977	269586	262244	111,4
Japan	387364	290081	227348	222452	78,4
South Korea	72831	131805	180477	186245	136,9
Germany	51736	47047	42260	39822	89,8
India	2206	8853	23141	26267	261,4
Russia	23377	28722	23759	19569	82,7
France	13870	14748	12771	13386	86,6
UK	22050	15490	11990	11592	77,4
Italy	7877	8877	10061	10281	113,3

PATENTS

CHANGER L'ÉNERGIE ENSEMBLE

WHAT IS A PATENT?



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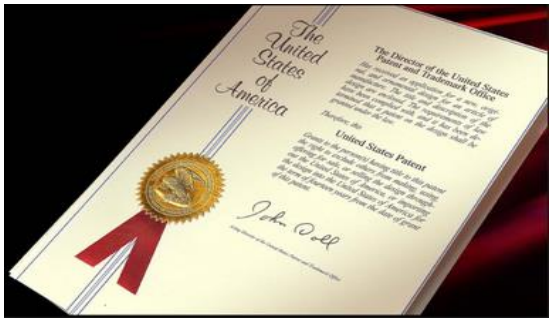


- Title of ownership defended by **claims** that define the scope of protection of the invention.
- Using « monopoly» may be an abuse of language

- **"Contract"** between the State and the inventor/owner, based on "exchange of rights and obligations":

⊕ The owner acquires **the rights to prohibit any third-party operation for a period of generally 20 years and in the countries where the annuities (fees) are paid.**

⊖ The owner has **to describe** his invention **sufficiently** to be able to be applied by those skilled in the art

⊖ The description of the invention will be published 18 months after the filling.

PATENT INVENTION

- **Legal tool for the protection of technical inventions in a given country, for a given period of time**

  ***Invention*: a technical solution that solves a technical problem**

  Legal provisions e.g. in the french Intellectual Property Code -
  Book VI: Protection of inventions and technical knowledge (available on legifrance.gov.fr)

- **An invention arises from the work of its authors: *the inventors***

  If they are employees, the patent usually belongs to their respective employers (after agreement between company and employee)

ONLY THE TECHNICAL INVENTIONS ARE PATENTABLE

An invention is protected by the *claims* of the patent

Claims?

List of 'objects' defined by technical features for which protection is sought,

Example: "Holding device comprising a strut resting on a base sealed to the structure (...)"

An invention is patentable if the *claims* of the *patent* meet the following (legal) requirements:

- ***Industrial application***: non-abstract and applicable to all types of industry
- ***Novelty***: the technical features of the invention are not included in ***the prior art***
- ***Inventive step :*** The technical features of the invention must not be **obvious** from the knowledge (alone or in combination) of ***the prior art***

WHAT IS NOT PATENTABLE

- Discoveries (caves, archeological sites ...)
- Scientific theories, mathematical or economic methods
- Aesthetic creations
- Drawings, information presentations
- Methods of treatment and medical diagnosis (▲)
- Animal breeds (cloning)
- Software (▲▲)
- Plant varieties (GMO, ...) (▲▲▲)
- Inventions contrary to public policy and morality

(▲) *However, instruments implementing the methods are generally patentable*

(▲▲) Beware of language abuse : ***<u>the</u> process*** *that produces a technical effect, implemented by* ***a software****, is patentable*

(▲▲▲) *Grant of a '**plant variety certificate'** instead*
It is referred to as a 'patent' by abuse of language... ex: GMO

TECHNICAL FEATURES

An invention is patentable if the *claims* of the *patent* meet the following legal requirements:

- ***Industrial application***: non-abstract and if it can be made or used in any kind of industry, including agriculture (EPC Article 57)

Claims **define the specific features of the invention that are to be protected.**

Non abstract = Technical

Technical ?

➡ Produce a technical effect AND/OR

➡ Use of technical or physical data AND/OR

➡ Use of “real” (technical) devices

Claim 1 : a device for securing an object to another which comprises :

- a flattened head on one end (Feature A)
- a sharp point on the other end (Feature B)
- a longitudinal body connected to both ends (Feature C)

A or/and B or/and C must be technical (real) or have a technical feature :

- Technical effect : a physical, measurable effect on the environment or the device (e.g. raise of temperature, pression, memory size…)
- Use technical or physical data : temperature, pixel size, wavelength….
- Use of « real » device : actuators, sensors**…**

NOVELTY

An invention is patentable if the *claims* of the *patent* meet the following legal requirements:

- ***Novelty***: the technical features of the ***claims*** are not included in ***the prior art***

The prior art? The state of the art shall be held to comprise everything made available to the public *(in all countries)* by means of a written or oral description (*in all languages*), by use, or in any other way, before the date of filing (EPC Article 54)

"In all forms" : generally written but could be audio, video…**if there are proofs**

Claim 1 : a Device for a technical domain T, which comprises :

- Feature A
- Feature B
- Feature C

A or/and B or/and C must be NEW

	Prior Art document D1	Prior Art document D2	Prior Art document D3
Claim 1			
Feature A	x	x	x
Feature B	o	x	x
Feature C	x	o	x

Claim 1 is NEW (compared to documents D1 and D2)

Claim 1 is NOT NEW (compared to document D3)

INVENTIVE STEP

An invention is patentable if the *claims* of the *patent* meet the following legal requirements:

- ***Inventive step :*** The technical features of the invention must not be **obvious** from the knowledge (alone or in combination) of ***the prior art***

(An invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art, EPC Article 56)

Claim 1 : a Device for a technical domain T, which comprises :

- Feature A
- Feature B
- Feature C

A or/and B or/and C must be INVENTIVE
(or produce a SURPRISING technical effect)

	Prior Art document D1	Prior Art document D2	Prior Art document D3
Claim 1			
Feature A	x	x	x
Feature B	o	x	x
Feature C	x	o	x

Claim 1 is NOT NEW (compared to document D3) => NOT INVENTIVE

INVENTIVE STEP

An invention is patentable if the *claims* of the *patent* meet the following legal requirements:

- ***Inventive step :*** The technical features of the invention must not be **obvious** from the knowledge (alone or in combination) of ***the prior art***

Claim 1 : a Device for a technical domain T, which comprises :

- Feature A
- Feature B
- Feature C

A or/and B or/and C must be INVENTIVE

	Prior Art document D1	Prior Art document D2
Claim 1		
Feature A	x	x
Feature B	**o**	x
Feature C	x	**o**

Claim 1 is NEW(i.e feature B or feature C)
=> INVENTIVE?

Is the knowledge from D1 and D2 (taken alone or combined) ***in the context of the problem to be solved***, WOULD lead ***the skilled in the art*** to find the feature B or feature C?
YES => obvious , not inventive
NO => inventive

NOTE : only technical features are examined for inventive step i.e.
=> if no technical feature => not inventive

PATENT TYPES 1/2

- **DEVICE PATENT (example @ slide 26)**
  Association of mechanisms, equipment contributing to produce a technical effect.
  Example: a cart locking device

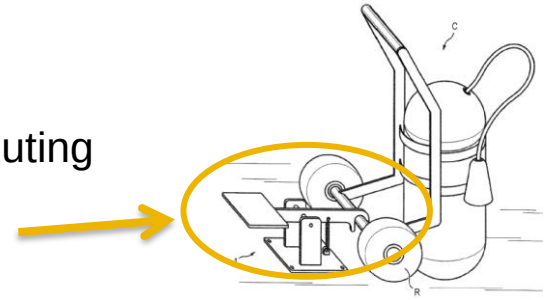
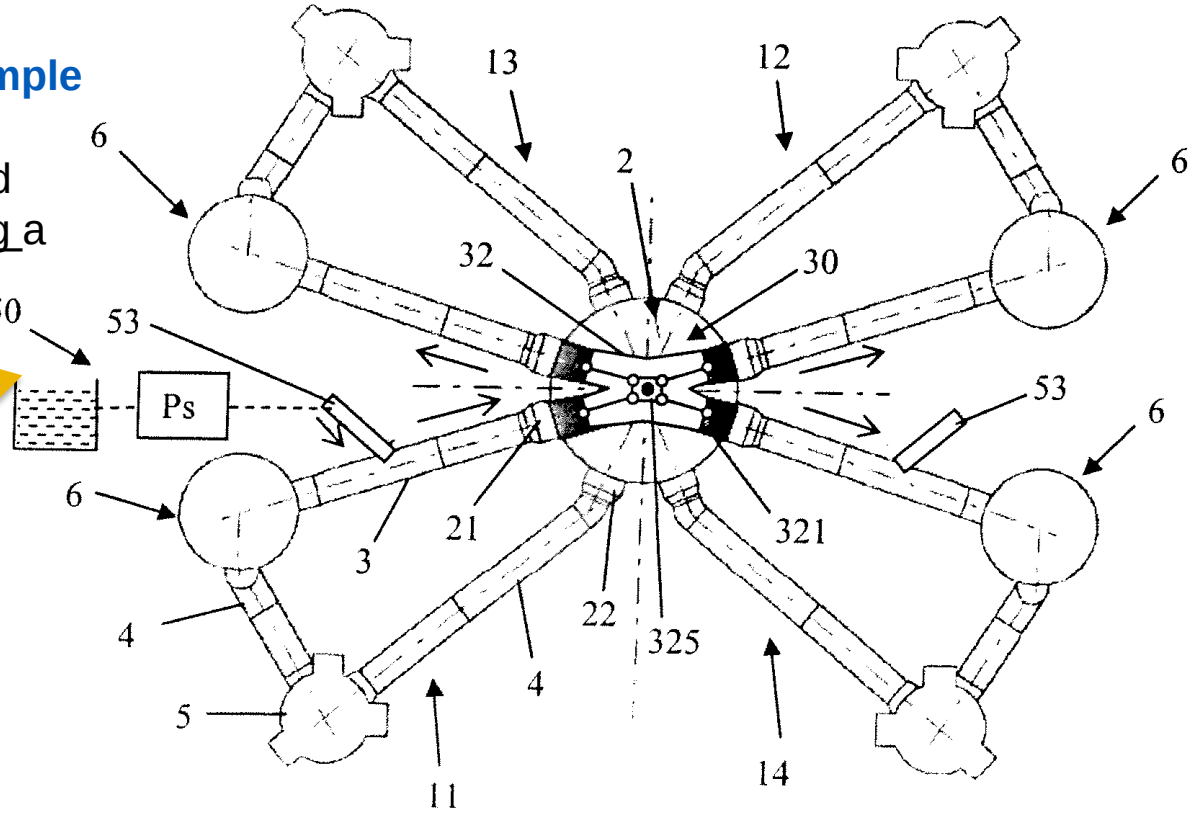


FIG. 4

- **PROCESS PATENT (example @ slide 27)**
  A combination of organized steps capable of producing a technical effect

Example: Method for removing air from a reactor coolant system of a nuclear power plant



IT IS POSSIBLE TO COMBINE BOTH…

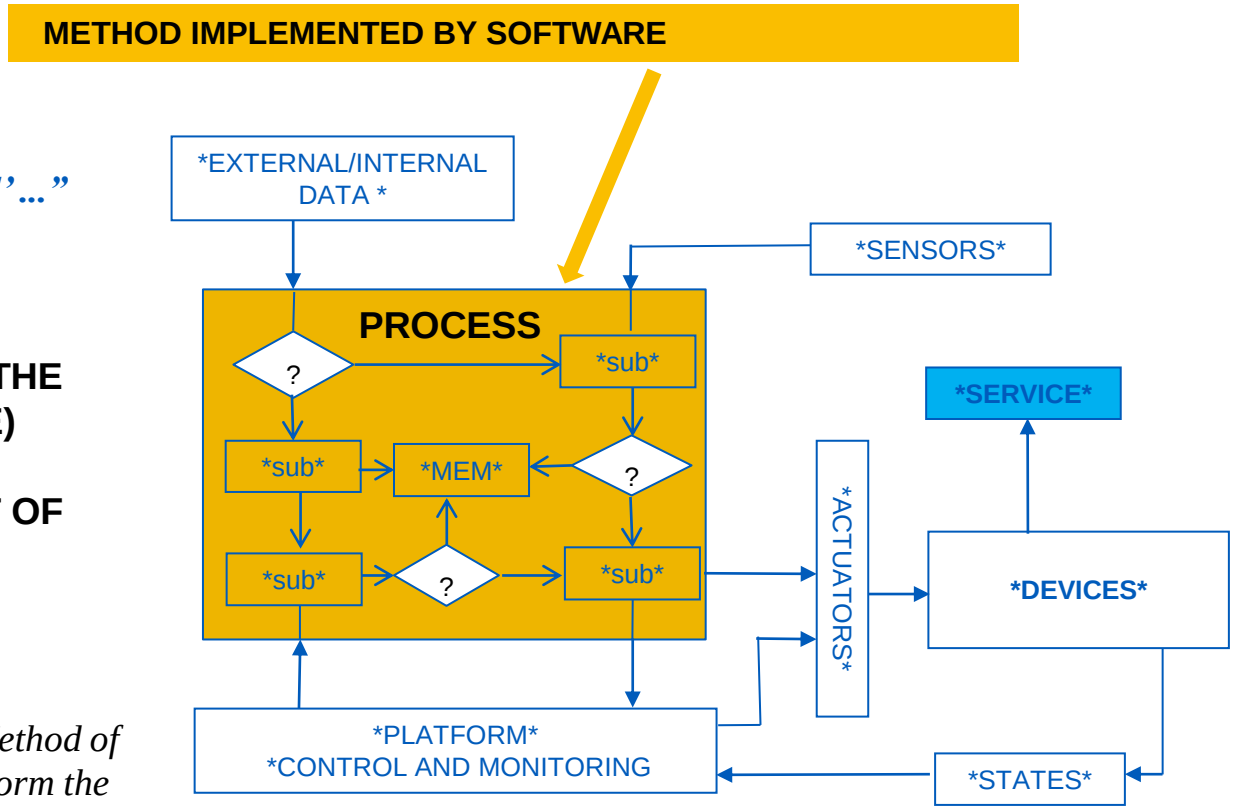
PATENT TYPES 2/2

- **PROCESS PATENT => « software patent »**

- ***"PATENT for a METHOD implemented by a 'SOFTWARE'..."*** **what are we talking about?**

- **IT IS NOT THE WRITING OF THE SOFTWARE (SOURCE CODE) THAT DEFINES THE PROTECTION, BUT THE SET OF PATENT CLAIMS**

- **IN THE PATENT CLAIM:** *"Method of controlling *DEVICES* to perform the *SERVICE*, according to a method* ***implemented by a computer program*** *…"*



The software is used under the conditions defined by the scope of the patent, conditions which disappear during an operation in a different context from the patent.

How to understand a patent

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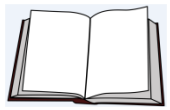
PATENT STRUCTURE



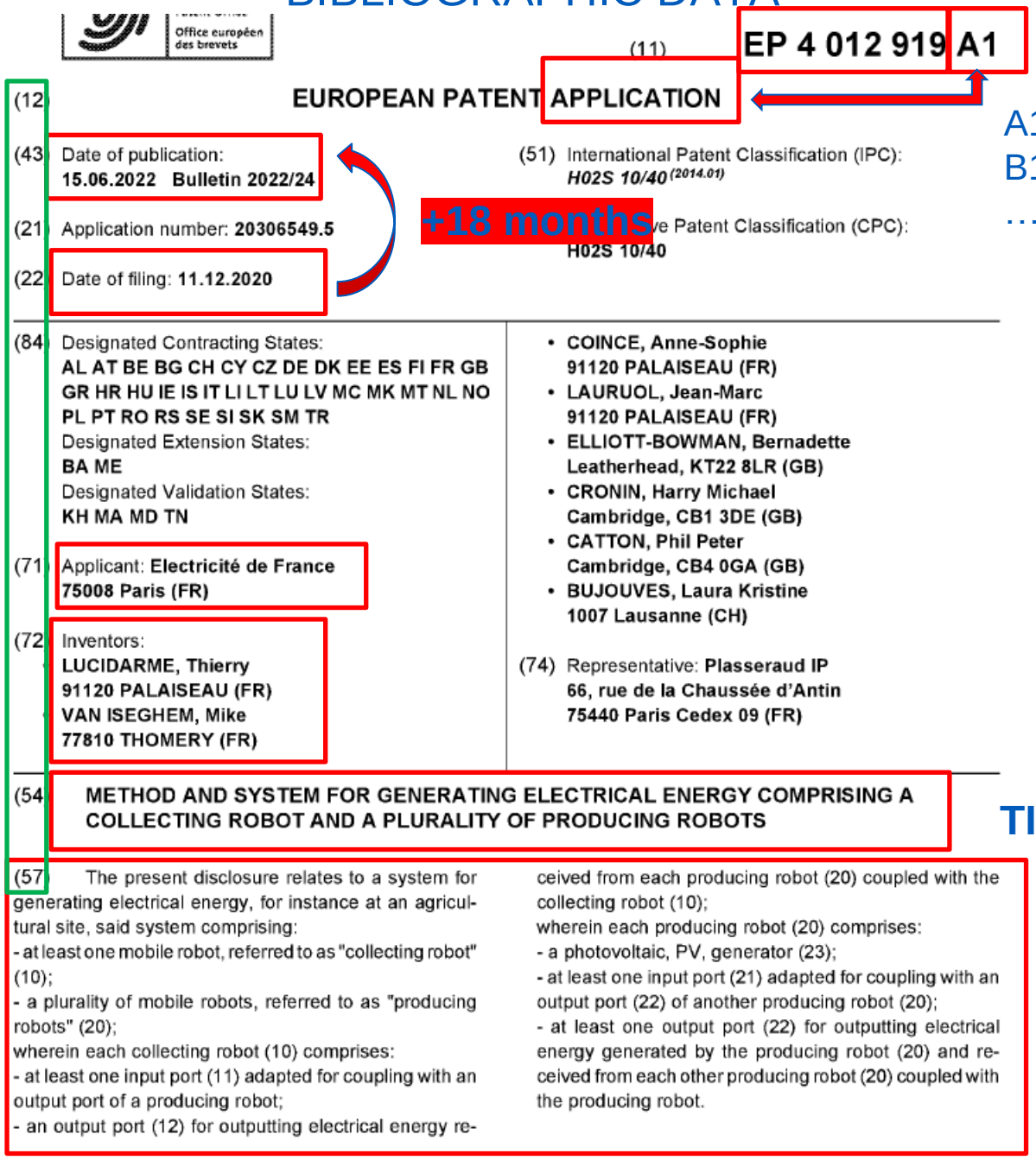
- **Bibliographic data** (title, classification, applicant identification, inventor, filing/publication/grant dates, short Abstract)

- **Description**, sufficient for the person skilled in the art to carry out the invention
  - The description is used to interpret/understand the meaning of the claims

- **Claims**
  - → These are the definitions of the objects for which protection is requested
  - → They must be supported by the description i.e. we only claim what we described

- **Documentary notice** (prior art / examiner's opinion), if avalaible

BIBLIOGRAPHIC DATA



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(22) Date of filing: **11.12.2020**

+18 months

(51) International Patent Classification (IPC):
H02S 10/40 *(2014.01)*

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H02S 10/40

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BA ME
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(54) **METHOD AND SYSTEM FOR GENERATING ELECTRICAL ENERGY COMPRISING A COLLECTING ROBOT AND A PLURALITY OF PRODUCING ROBOTS**

(57) The present disclosure relates to a system for generating electrical energy, for instance at an agricultural site, said system comprising:
- at least one mobile robot, referred to as "collecting robot" (10);
- a plurality of mobile robots, referred to as "producing robots" (20);
wherein each collecting robot (10) comprises:
- at least one input port (11) adapted for coupling with an output port of a producing robot;
- an output port (12) for outputting electrical energy received from each producing robot (20) coupled with the collecting robot (10);
wherein each producing robot (20) comprises:
- a photovoltaic, PV, generator (23);
- at least one input port (21) adapted for coupling with an output port (22) of another producing robot (20);
- at least one output port (22) for outputting electrical energy generated by the producing robot (20) and received from each other producing robot (20) coupled with the producing robot.

A1 : application
B1 : patent
…

Common references, used by all countries

TITLE

ABSTRACT

DESCRIPTION

Description

TECHNICAL FIELD

TECHNICAL DOMAIN

[0001] This disclosure relates to electrical energy generation and relates more specifically to a method and system for generating electrical energy that requires little or no infrastructure at a target electrical energy production site.

[0002] The present disclosure finds a particularly advantageous application, although in no way limiting, for producing electrical energy at agricultural sites.

BACKGROUND ART

[0003] In general, installing fixed photovoltaic, PV, panels on an agricultural land uses heavy machinery that causes soil compaction. This compaction can take years to repair and affects the viability of the soil for crop growing.

[0004] Also, once fixed PV panels are installed in a given area, the soil in that area can no longer be used for crop growing, or at least not for any type of crop if the crop is grown below the fixed PV panels. Hence, installing fixed PV panels may affect the available surface for crop growing.

[0005] Also, fixed PV panels produce electricity but only for equipment in the area where they are installed. In case of a (temporary) need for electrical energy in another area, new additional connecting installations are necessary.

STATE OF THE ART AND PROBLEMS (here 3) TO SOLVE

DESCRIPTION

SUMMARY

[0006] The present invention aims at improving the situation. In particular, the present invention aims at overcoming at least some of the limitations of the prior art discussed above, by proposing a solution enabling temporary and flexible installation of PV generation means in a target area.

[0007] According to a first aspect, the present disclosure relates to a system for generating electrical energy, for instance at an agricultural site, comprising:

- at least one mobile robot, referred to as "collecting robot";
- a plurality of mobile robots, referred to as "producing robots";

wherein each collecting robot comprises:

- at least one input port adapted for coupling with an output port of a producing robot, for receiving electrical energy thereof;
- an output port for outputting electrical energy received from each producing robot coupled with the collecting robot;

wherein each producing robot comprises:

- a photovoltaic, PV, generator for generating electrical energy;
- at least one input port adapted for coupling with an output port of another producing robot, for receiving electrical energy thereof;
- at least one output port for outputting electrical energy generated by the producing robot and received from each other producing robot coupled with the producing robot.

SUMMARY OF THE INVENTION
(copy of claims + advantages of the features over the state of the art)

[0008] Hence, the system enables to build a PV installation composed by a plurality of mobile robots. These mobile robots may be e.g. autonomous or remotely controlled. Since these robots are mobile, so is the PV installation which may be temporarily installed only when needed in a target area, which may be moved from a target area to another one, etc.

[0009] The temporary PV installation may be obtained by coupling a plurality of mobile robots comprising at least one collecting robot and a plurality of producing robots. Such plurality of coupled mobile robots is referred to as "array" of coupled mobile robots. The mobile robots of the array are coupled once they have moved to the target area, said coupling enabling electrical energy transfer from one mobile robot to another. Each producing robot carries a PV generator and can produce electrical energy. The collecting robot, which may or may not be configured to produce electrical energy, is configured to collect electrical energy from all the producing robots it is coupled with, either directly or indirectly through another producing robot.

[0010] Hence, even though the PV installation comprises a plurality of mobile robots, the electrical energy produced by an array of coupled mobile robots may be retrieved at a single output port of the collecting robot.

[0011] The array may comprise an arbitrary number of producing robots, such that the temporary PV installation may be adapted by configuration to specific electrical power needs, by e.g. increasing the number of producing robots when

DESCRIPTION

BRIEF DESCRIPTION OF DRAWINGS

[0039] The invention will be better understood upon reading the following description, given as an example that is in no way limiting, and made in reference to the figures which show:

- Figure 1: a schematic representation of an exemplary embodiment of a collecting robot of a system for generating

SUMMARY OF THE FIGURES

electrical energy;
- Figure 2: a schematic representation of an exemplary embodiment of a producing robot of a system for generating electrical energy;
- Figures 3 and 4: schematic representations of examples of different couplings between a collecting robot and a producing robot;
- Figure 5 and 6: schematic top-view representations of exemplary embodiments of a collecting robot and a producing robot;
- Figure 7: schematic top-view representations of examples of arrays of coupled mobile robots;
- Figure 8: a diagram representing the main steps of an exemplary embodiment of a method for generating electrical energy;
- Figure 9: schematic top-view representations of examples of arrays of coupled mobile robots in target areas.

[0040] In these figures, references identical from one figure to another designate identical or analogous elements. For reasons of clarity, the elements shown are not to scale, unless explicitly stated otherwise.

DESCRIPTION

DESCRIPTION OF EMBODIMENTS

[0041] The present disclosure relates to a system for generating electrical energy that may be used for instance at an agricultural site, or any site where temporary generation of electrical energy may be required.

[0042] The system comprises a plurality of mobile robots, which may be e.g. autonomous or remotely controlled. Since these robots are mobile, they may be e.g. stored in a parking area when no electrical energy is to be produced and moved on-demand to a target area when electrical energy is to be produced.

[0043] The mobile robots are mainly of two types:

DETAILED DESCRIPTION with Figures

- a producing robot is used mainly to generate electrical energy; and
- a collecting robot is used mainly to collect electrical energy generated by a plurality of producing robots coupled to said collecting robot, and to output it to an output port from which the electrical energy can be used.

[0044] Typically, when required, at least one collecting robot and a plurality of producing robots travel to a target area. Once positioned in the target area, couplings are established between the mobile robots in order to form an array of coupled mobile robots, a "coupling" between two mobile robots enabling electrical energy transfer from one mobile robot to the other.

[0045] Figure 1 represents schematically an exemplary embodiment of a collecting robot 10. As can be seen in figure 1, the collecting robot 10 comprises displacement means 14 adapted to move the collecting robot 10 e.g. from a parking area to a target area. The displacement means 14 may be of any type known to the skilled person, and the movement of the collecting robot 10 may be terrestrial and/or aerial. For instance, the collecting robot 10 may be an unmanned terrestrial vehicle, UTV, and/or an unmanned aerial vehicle, UAV. Preferably, the displacement means 14 are electrical, and comprise e.g. one or more electrical motors for rotating wheels and/or propellers.

[0046] Also, the collecting robot 10 comprises at least one input port 11 adapted for coupling with a producing robot 20 for receiving electrical energy thereof. Preferably, the collecting robot 10 comprises a plurality of input ports 11 for e.g. coupling simultaneously with a plurality of producing robots 20 and/or for enabling different types of couplings with producing robots 20 (e.g. mechanical coupling, wireless coupling, etc.) and/or for increasing geometrical coupling flexibility by providing multiple different possible positions for a producing robot 20 to be coupled with the collecting robot 10.

[0047] The collecting robot 10 comprises also an output port 12 for outputting electrical energy received from each producing robot 20 coupled with the collecting robot 10. As discussed above, the purpose of the collecting robot 10 is mainly to centralize electrical energy received from a plurality of producing robots 20. Accordingly, the collecting robot 10 may comprise a single output port 12. However, the collecting robot 10 may also, in other examples, comprise a plurality of output ports 12 for supplying electrical energy to a plurality of equipment and/or for enabling different types of connections with equipment to be supplied with electrical energy (e.g. mechanical connection, wireless connection, etc.). In preferred embodiments, the collecting robot 10 may be a tethered mobile robot in which the output port 12 is located at an end of a cable. Preferably, a tethered collecting robot 10 comprises a cable reel, for e.g. enabling storing the cable in a compact manner when not in use.

FIGURES

References

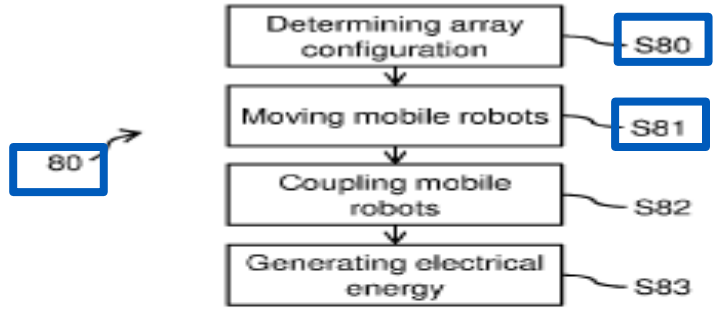


Fig. 8

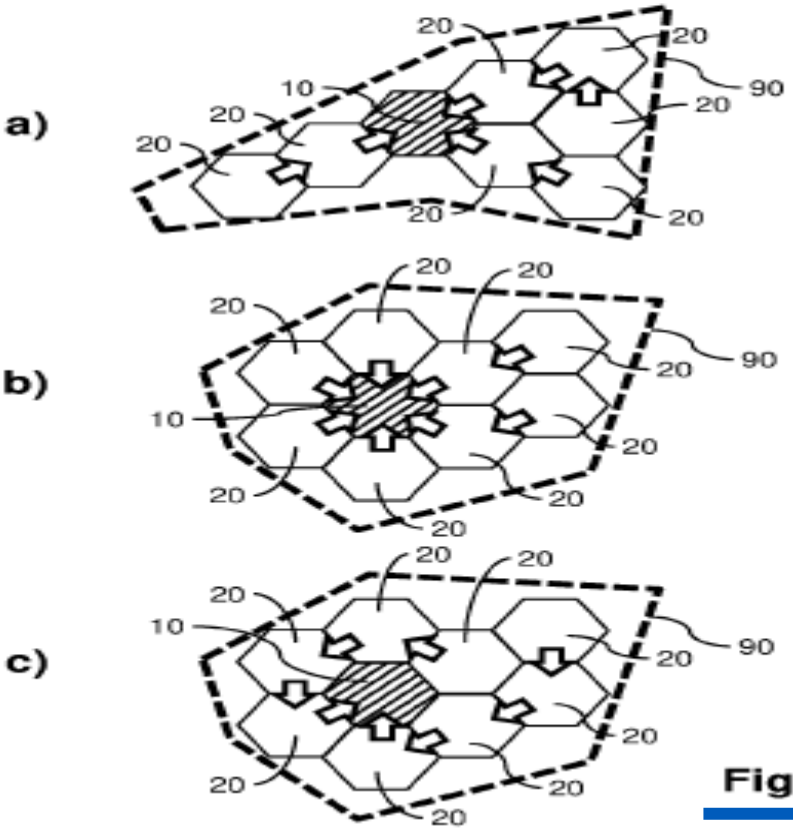


Fig. 9

CLAIMS

Claims

TYPE of CLAIM TECHNICAL FIELD

1. A system for generating electrical energy, for instance at an agricultural site, said system comprising:

- at least one mobile robot, referred to as "collecting robot" (10);
- a plurality of mobile robots, referred to as "producing robots" (20);

Features

wherein each collecting robot (10) comprises:

- at least one input port (11) adapted for coupling with an output port of a producing robot, for receiving electrical energy thereof;
- an output port (12) for outputting electrical energy received from each producing robot (20) coupled with the collecting robot (10);

Feature

wherein each producing robot (20) comprises:

- a photovoltaic, PV, generator (23) for generating electrical energy;

Feature

- at least one input port (21) adapted for coupling with an output port (22) of another producing robot (20), for receiving electrical energy thereof;

Feature

- at least one output port (22) for outputting electrical energy generated by the producing robot (20) and received from each other producing robot (20) coupled with the producing robot.

Feature

Object 1

2. System according to claim 1, wherein each input port and each output port of a producing robot is connected to PV cells of the PV generator of said producing robot, such that the PV cells of coupled producing robots form a macro PV generator grouping the respective PV generators of the coupled producing robots.

Feature

Object 2 = Claim 1 + 2

3. System according to any one of the preceding claims, wherein the PV generator of a producing robot has a polygonal shape having at least three sides, and wherein at least one input port and at least one output port are located on different sides of the PV generator.

Feature

Object 3' = Claim 1 + 2 + 3

Object 3'' = Claim 1 + 3

CLAIMS

TYPE of CLAIM

TECHNICAL FIELD

14 Method (80) for generating electrical energy, for instance at an agricultural site, by using a system according to any one of the preceding claims, said method comprising:

Features - (S80) determining a configuration of an array of coupled mobile robots comprising at least one collecting robot and a plurality of producing robots, said array configuration defined by a number of mobile robots of the array, respective target positions and target orientations of the mobile robots of the array, and couplings to be established between input ports and output ports of the mobile robots of the array such that each producing robot is coupled directly or indirectly to the collecting robot;

Features - (S81) commanding the uncoupled mobile robots to move from their respective current positions to their respective target positions and target orientations of the array configuration;

Features - (S82) coupling the input ports and output ports of the mobile robots of the array according to the couplings defined in the array configuration;

Features - (S83) generating electrical energy by the array of coupled mobile robots and outputting generated electrical energy at the output port of the collecting robot.

15 Method (80) according to claim 14, wherein the array configuration is determined based on a predetermined target level of electrical energy to be generated and/or based on a target area configuration, said target area configuration comprising at least one of the following:

Features - position of an extraction point to be connected to the output port of the collecting robot;
- information on a size and/or a shape of the target area where the array of coupled mobile robots is to be stationed;
- weather information for the target area;
- scheduled time interval during which the array of coupled mobile robots is to be formed.

SEARCH REPORT = CLOSEST PRIOR ART

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 20 30 6549

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	CN 109 911 144 A (NINGBO JINGHAI ZHIHANG TECH CO LTD) 21 June 2019 (2019-06-21) * the whole document *	1-5,9, 10,12-16 6-8,11	INV. H02S10/40
Y	US 2019/308514 A1 (PARIMI PATANJALI V [US] ET AL) 10 October 2019 (2019-10-10) * paragraphs [0002], [0004], [0059], [0072], [0093]; figure 1 *	6-8	
Y	YANQIONG FEI ET AL: "Design of the solar-driven module on modular mobile robot", MECHATRONICS AND MACHINE VISION IN PRACTICE (M2VIP), 2012 19TH INTERNATIONAL CONFERENCE, IEEE, 28 November 2012 (2012-11-28), pages 470-473, XP032346637, ISBN: 978-1-4673-1643-9 * abstract; figure 1 *	11	

Document codes

Targeted claims

1

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Berlin	4 May 2021	Stirn, Jean-Pierre

Patent office examiner

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

EDF

WRITTEN OPINION

The present application does not meet the requirements of Article 52(1) EPC because the subject-matter of claims 1-5, 9,10,13, 14-16 is not new within the meaning of Article 54(1) and (2) EPC.

Document D1 (the whole document, figures 6-8) discloses a system for generating electrical energy, said system comprising:
- at least one mobile robot (1), referred to as "collecting robot";
- a plurality of mobile robots (1), referred to as "producing robots"; wherein each collecting robot comprises:
- at least one input port (3-1) adapted for coupling with an output port (3-2) of a producing robot, for receiving electrical energy thereof;

The subject-matter of dependent claims 2-5, 9, 10, 13 is also known from document D1.

Indeed document D1 also discloses that each input port and each output port of a producing robot is connected to PV cells of the PV generator of said producing robot, such that the PV cells of coupled producing robots form a macro PV generator grouping the respective PV generators of the coupled producing robots. (see figure 6- 2) In document D1 the collecting robot can also have a solar panel as it has the same configuration as the producing robots. (claims 2, 9)

Document D1 also discloses that the PV generator of a producing robot has a polygonal shape having at least three sides, and wherein at least one input port and at least one output port are located on different sides of the PV generator. (see figure 6) The same applies to a collecting robot as they have the same shape in document D1. (claims 3, 10)

Document D1 discloses that the PV generator of a producing robot has a triangular shape or a square shape or a hexagonal shape. (see paragraph 33) (claim 4)

The present application does not meet the requirements of Article 52(1) EPC because the subject-matter of claims 6-8,11,12 does not involve an inventive step within the meaning of Article 56 EPC.

The combination of document D1 and D2 renders dependent claim 6 not inventive since document D2 (paragraphs [0002], [0004], [0059]; figure 1) discloses a wireless power transfer module which forms part of a robot as an input port for electrical energy. (claim 6)

The robot of document D2 (paragraph 72) is described as being is an unmanned terrestrial vehicle, UTV (claim 7).

The robot of document D2 is shown in figure 1 (paragraph 93) as an unmanned aerial vehicle, UAV. (claim 8)

Document D3 discloses (* abstract, figure 1) one mobile robot comprising means for modifying the inclination of a PV surface of a PV generator of said mobile robot with respect to a main body of said mobile robot. (claim 11)

It is well known starting from document D1 to foresee one collecting robot as a tethered mobile robot in which the output port is located at an end of a cable. (claim 12)

Adversarial procedure: you can/must counter-argue (technically)

RESPONSE TO WRITTEN OPINION

1) Amendments

New claim 1 corresponds to previous claim 1, herein amended to recite that the electrical energy generated is *"to be supplied to an equipment at a target area"* and that "*at least one collecting robot and a plurality of producing robots are coupled together and the output port of the at least one collecting robot is connected to the equipment, and the collecting robot is configured to collect electrical energy from all the producing robots it is coupled with and to supply the equipment with the collected electrical energy at the target area"* (see e.g. page 2 lines 8-25, page 9 lines 3-7, page 19 lines 27-31 of the patent application as filed).

!! each word as a meaning and consequences!!

You can only claim what you described

New claims 2-13 correspond to previous claims 2-13.

Novelty

Such water rescue robots need to search for people to be rescued at sea, without knowing exactly the positions of these people. These people may be far from where the mobile robots are stationed, and an important area might need to be searched for finding the people to be rescued. Hence, these mobile robots need strong self-sustaining power (see e.g. §6 of D1), and they are equipped with PV generators to recharge their own batteries (see e.g. §28 of D1).

The mobile robots in D1 can also be connected electrically, for charging their batteries. Hence, a mobile robot in D1 can also receive electrical energy from another mobile robot in order to charge its own battery (se e.g. §43 of D1).

Hence, in D1, the mobile robots aims at rescuing people at sea, and D1 fails to teach or suggest using the mobile robots to supply electrical energy to another equipment located at the target area.

Also, in D1, the mobile robots can be connected electrically, but a mobile robot can only receive electrical energy from another mobile robot, not forward on an output port the electrical energy received on an input port.

2.3) Inventive step

As discussed above D1 aims at rescuing people at sea and is not related whatsoever to supplying electrical energy to an equipment at a target area.

In D1, the target area (i.e. where are located the people to be rescued) is not known beforehand, and the goal of having self-sustaining power mobile robots is precisely to be able to inspect a large sea surface to actually find the people to be rescued (and, thereby, find the target area). Also, D1 aims at rescuing people that have fallen to the water (see e.g. §5 of D1). Accordingly, there is no equipment that needs to be supplied with electrical energy at the target area, only people.

Hence there is no motivation for the skilled person to modify the teachings of D1 to obtain the subject-matter of claim 1.

The subject-matter of claim 1, at least as amended herein, is inventive with respect to D1.

LIFE OF A PATENT

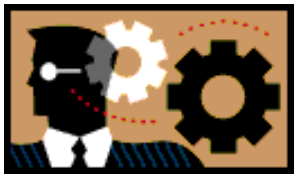
Priority date of filing and extensions

CHANGER L'ÉNERGIE ENSEMBLE

KEEP IN MIND :

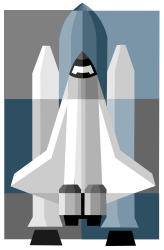
Problem:
"go to mars .. "

+



Inventive step:
"Um... how do you do it without obvious knowledge?"

=



A new and inventive solution

Protection: the patent

If there is an invention, there is an inventor: a physical person

- *The invention must be sufficiently described to be comprehensible and implementable by those skilled in the art:*

☞ *This is the pinciple of the dissemination of knowledge in exchange for protection granted by the State*

☞ *Patent application will be examined in scope and patentability criteria*

It is possible to file a patent for :

Products

Mechanical, chemical, electrical devices
Materials, Molecules

Processes

Methods of manufacture, control, operation ...

WHERE TO FILE A PATENT?

National filing – (in France, INPI - French national patent office)

Each country has its own legal codes governing and authorizing the filing of patents, especially the conditions to have a regular date of fling

e.g French Intellectual Property Code - Book VI: Protection of inventions and technica knowledge (available on legifrance.gov.fr)

Paris Convention for the Protection of Industrial Property:

The Paris Convention for the Protection of Industrial Property was signed in Paris, France, in 1883. It was one of the first intellectual property **treaties** to cover patent and trademark law.

Regional filing : European filing at European Patent Office (EPO)

This is a supra-national European organization that enables European patent applications to be filed and patents to be processed centrally in Europe (not limited to political Europe).
Created by the Munich Convention.
« Legal » code : Convention on the Grant of European Patents (European Patent Convention) also gives the conditions to have a regular date of fling

« International » filing at World Intellectual Property Organization (WIPO) using Patent Cooperation Treaty (PCT)

*Organization that manages worldwide intellectual property services, policy, information and cooperation, **with 193 member states**.*

"The Patent Cooperation Treaty (PCT) makes it possible to seek patent protection for an invention simultaneously in each of a large number of countries by filing an "international" patent application. Such an application may be filed by anyone who is a national or resident of a PCT Contracting State";

Also provides a regular filing date

WHERE TO FILE A PATENT?

Notion of Priority date :

Paris Convention for the Protection of Industrial Property (article 4):

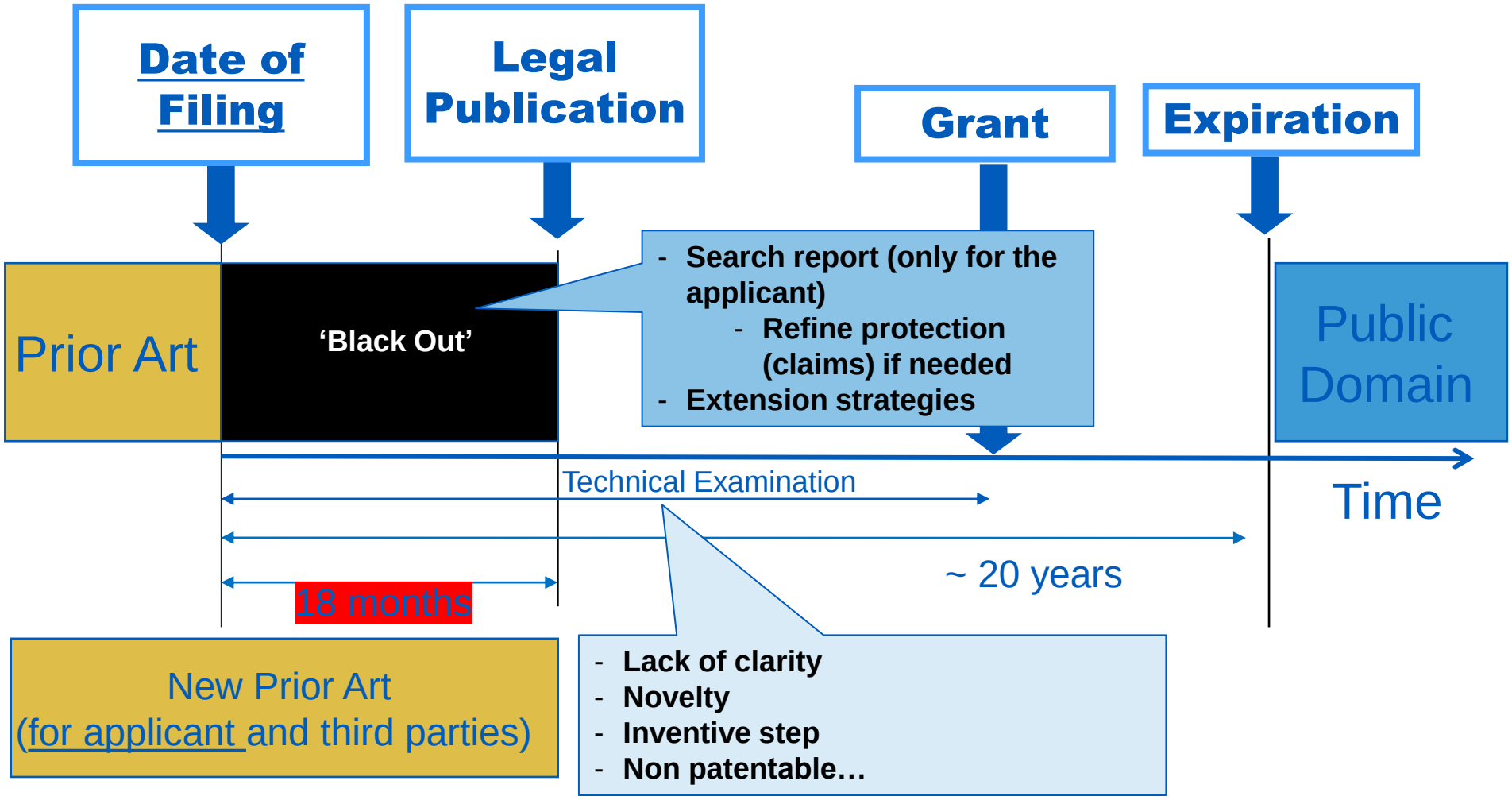
The Convention provides for the **right of priority** in the case of patents.
This **right** means that, on the basis of a regular first application filed in one of the Contracting States, the applicant may, within a certain period of time (12 months for patents), apply for protection in any of the other Contracting States.

These subsequent applications will be regarded as if they had been filed on the same day as the first application. In other words, they will have **priority** ("right of priority") over applications filed by others during the said period of time for **the same invention**.

Moreover, these subsequent applications, being based on the first application, **will not be affected by any event that takes place in the interval**, such as the publication of an invention or the sale of articles bearing a mark or incorporating an industrial design

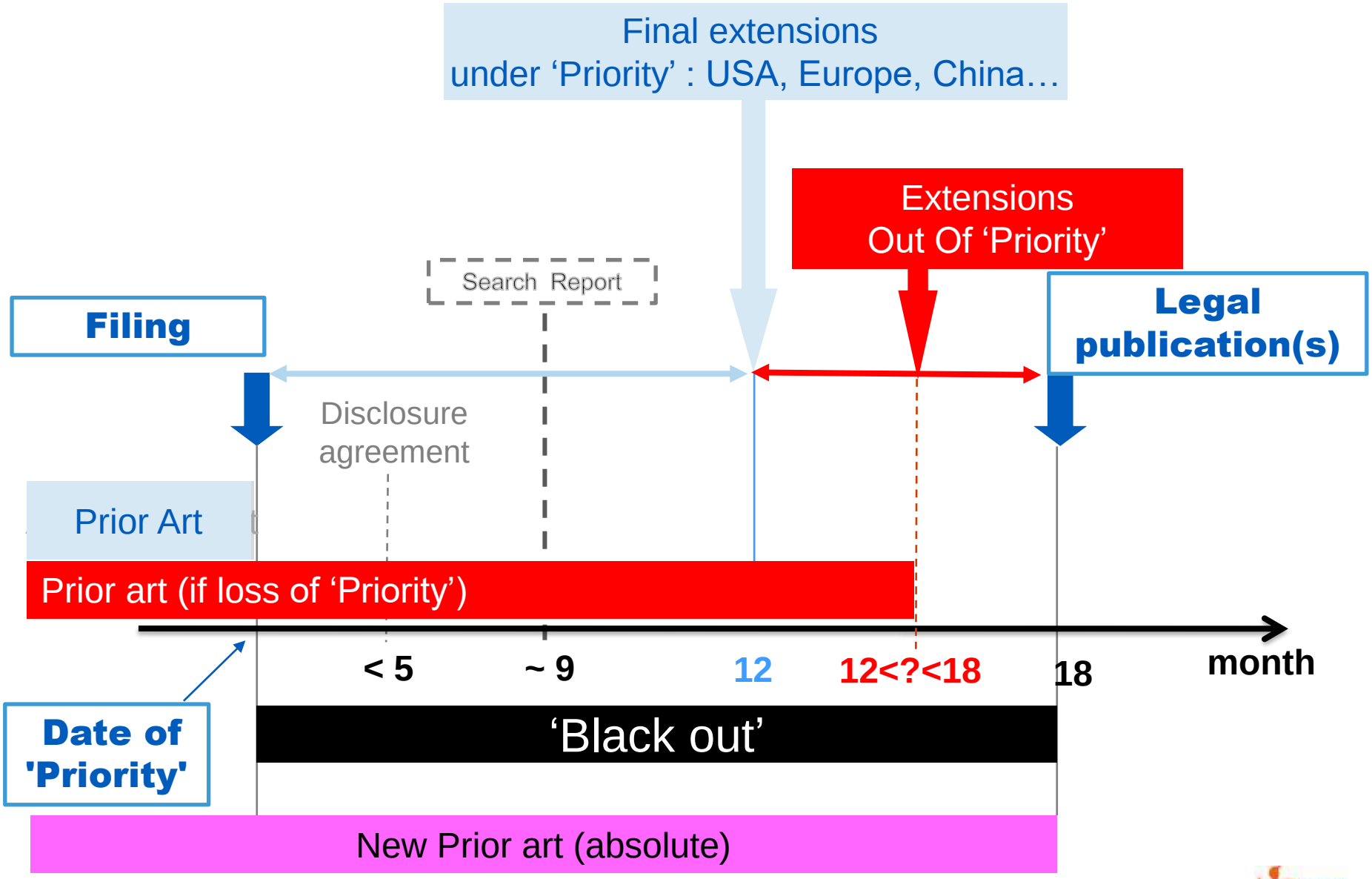
A great part of the world's countries or regional organizations refer to the Article 4 of the Paris Convention or reuse its wording in their industrial property codes

THE LIFE OF A PATENT

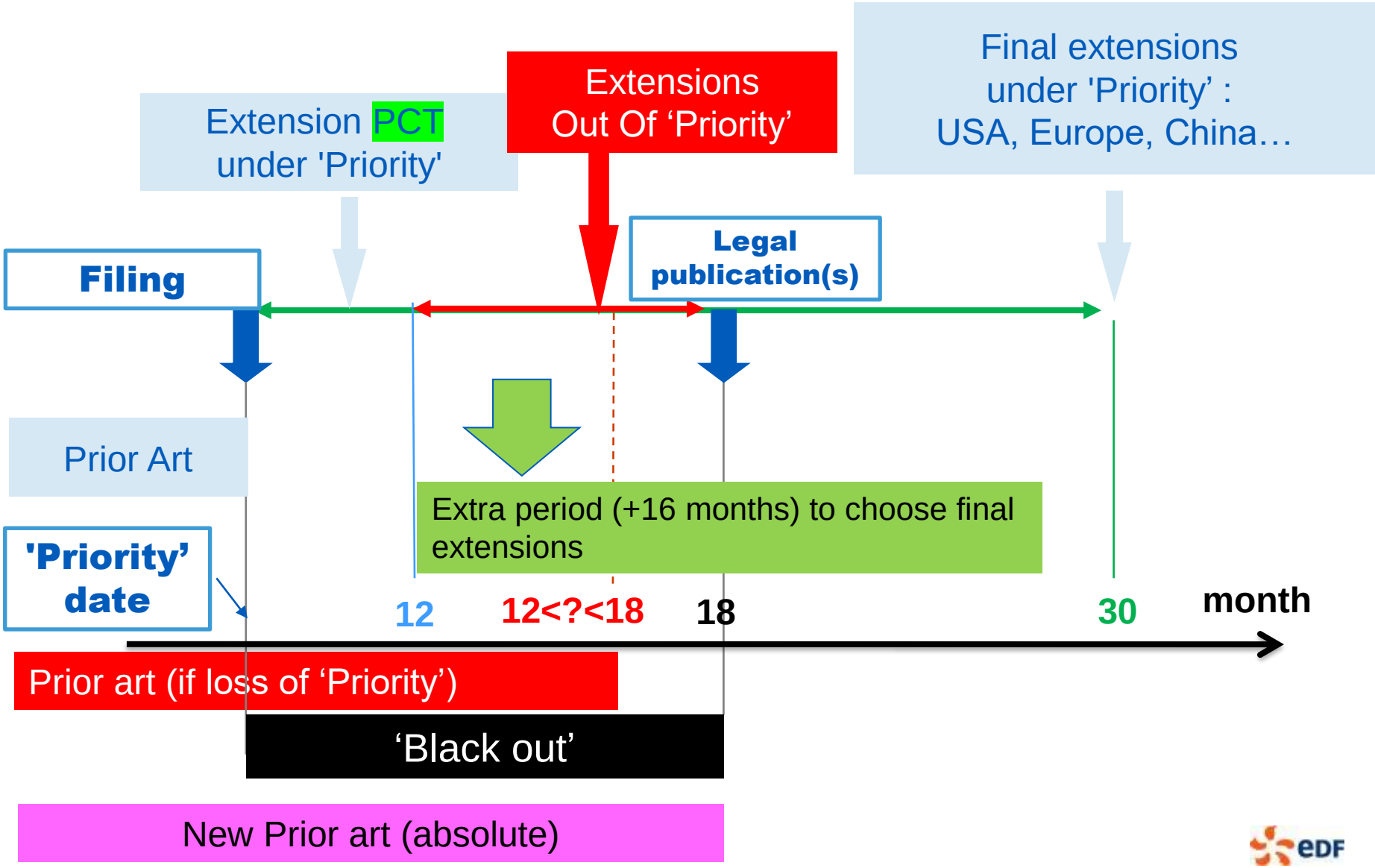


Note : from the 1st year of filing, annuities (fees) must be paid; otherwise, loss of protection

FROM FILING TO PUBLICATION AND EXTENSIONS (WITHOUT PCT)



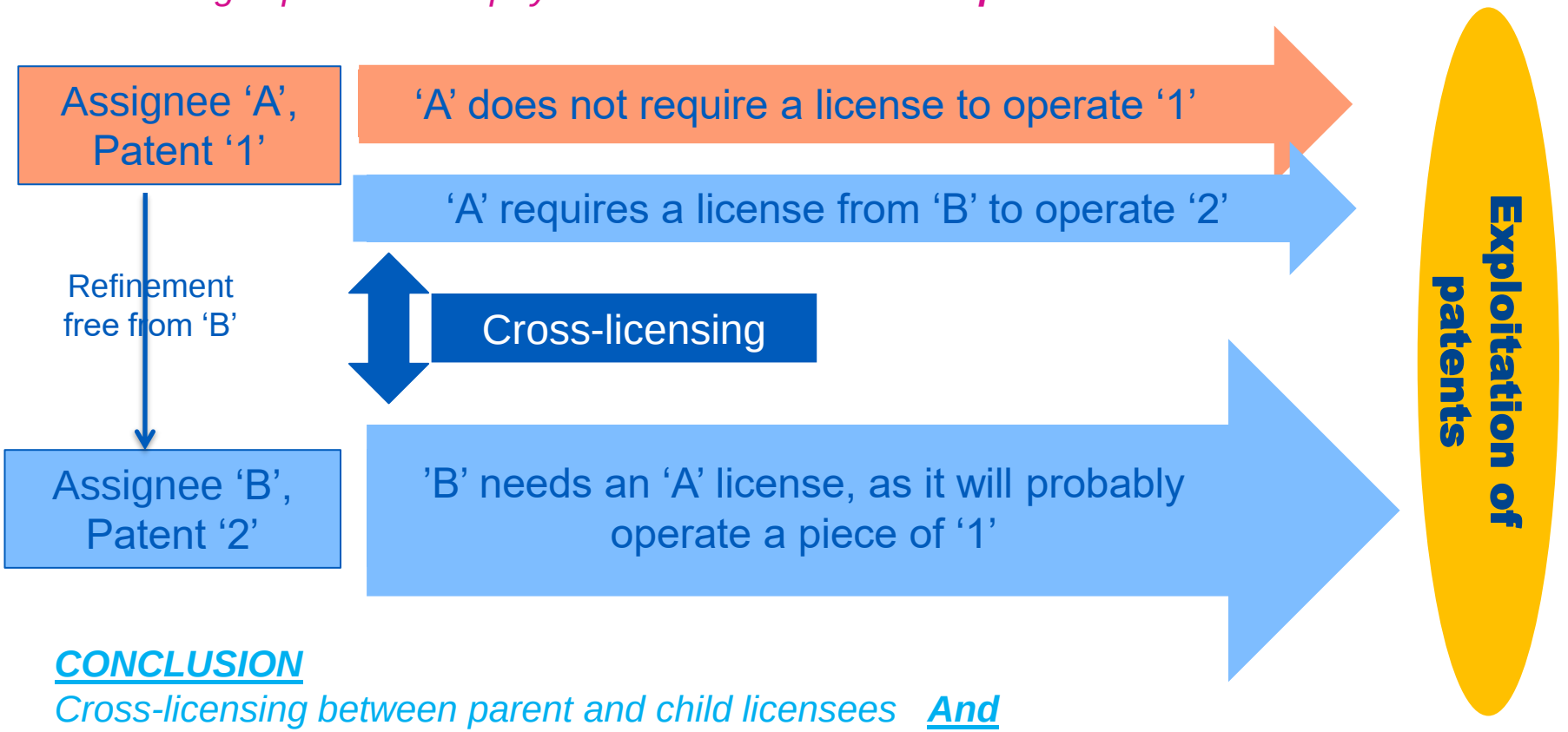
FROM FILING TO PUBLICATION AND EXTENSIONS (WITH PCT)



HOW DO I PROTECT AN IMPROVEMENT?

- **On the basis of a patent ...** ... which belongs to the same company
  - → *file preferably within 18 months of the "Black out"*
  - → *filing of a "child" patent with **free exploitation***

- **On the basis of a patent ...** ... owned by third parties:
  - → *Filing is possible but pay attention to **freedom to operate!!***



CONCLUSION

Cross-licensing between parent and child licensees ***And***
Opportunity to collaborate on future patent co-ownership

The concept of inventor

CHANGER L'ÉNERGIE ENSEMBLE

WHO IS ELIGIBLE FOR INVENTOR STATUS?

An inventor (one or more) is a physical person that set up the solution (i.e. the claims)

(EPO publishes decision to reject two patent applications designating a machine as inventor on 28 January 2020)

"A" and **"B"** are two physical persons

- "**A**" has an imperfect or incomplete design, "**B**" works with it and helps to perfect or complete it to find a solution to the problem.

Who is the inventor(s)?

'A' and 'B' are co-inventors

- **"A"** designs a solution to a theoretical technical problem...**"A"** talks to **"B"** who confirms the validity of the concept by putting it into practice.

Who is the inventor(s)?

'A' is the sole inventor

- "**A**" describes different approaches and ideas to "**B**" who finds a solution to the problem.

Who is the inventor(s)?

'B' is the sole inventor

An incorrect designation of inventors can stop the entire procedure or invalidate a patent

PATENT ISSUES

CHANGER L'ÉNERGIE ENSEMBLE

PATENT PROFITS AND LIMITATIONS

- ‘Contract’ between the State which protects the rights of the inventor, which in return must describe in **sufficient detail** the invention

- Legal publication (18 months after filing)
  imitation, bypass, perfection
- 20-year time and territorial limits
  Maintenance costs vs. potential value
- Ineffectiveness of patents in meeting standards → market law
  - *Betamax (Sony) vs. **VHS** (JVC)*
    VHS format has won; lower technology but recording times are longer
  - ***Blu-Ray** (Sony) vs. HD DVD (Toshiba)*
    The Blu-ray format has become the standard for film producers

PATENTING DECISION SUPPORT KEYS
ACCORDING TO THE TYPE OF INVENTION

		Patent?		Comments
• **If it is...** **a piece of equipment, device...**			**YES**	Options recommended due to possible ***'reverse engineering'***
• **If it is...** **a material**	• and the analysis makes it possible to know all the compounds and the method of manufacture		**YES**	
	• and analysis does not allow it	**NO**		Secret is preferable → Registration of **know-how**
• **If it is...** **a process**			**YES, but...**	... describe the principle, not the optimal parameters (e.g only the ranges)
• **If the examination of counterfeits is impossible**		**NO**		**Disclose!**
• **If the invention is not fully complete**		**NO**		**KEEP THE SECRET** This avoids analyzes by third parties at the time of publication

REASONS FOR NOT PATENTING

THE RIGHT REASONS

- Too much prior art
- Scalable or not yet fully mature technology
- We know and we can guarantee protection by secrecy
- We can’t keep up with the market
- There is no competition
- The technology is isolated with no prospect of development in the technical field

THE WRONG REASONS

- It's not "the invention of the century"
- It's hard to patent
- It only gives me extra work
- We'll see later...

  (around *7,000 filings/day worldwide!)*
- A SOLEAU envelope has been filed
- We've got a know-how record
- My partner will file for us
- No one is interested in this market (except us)

(OTHER) USES OF PATENTS

ATTACK AND DEFENSE

- Obtain a right to prohibit - timely and territorially
- Protect against attacks - undermine the technical field
- Hindering competition - "dam" or "lure" patents

VALUE ENHANCEMENT STRATEGIES

- Grant exploitation through licenses
- Facilitate technical cooperation through cross-licensing, co-ownership
- Reassuring investors through IP acquisitions
- Bringing the patent in a company - business start-up
- Ensuring the value of a technology by standards

SKILL SHOWCASE

- Sending out a signal of skills - companies and inventors
- Communicate your values - image patents

Patent Infringement, Freedom To Operate

CHANGER L'ÉNERGIE ENSEMBLE

INFRINGEMENT AND FREEDOM TO OPERATE

Infringement = Operate in a country, an object covered by a patent (at least a claim) in force in that country, without agreement of the owner

The covered acts are: manufacturing, offering , placing on the market, using, importing, exporting, transshipment or holding (device/process)

'X' has a patent in Territory 'A' only.
'**Y' wants to operate the patent**, in territory 'A' or 'B', does not have a license from 'X'

SITUATION	ALLOWED?
'Y' manufactures in 'B', and operates in 'A'	**NO**
'Y' manufactures 'A' and operates 'A'	**NO**
'Y' manufactures in 'A', and operates in 'B'	**NO**
'Y' manufactures 'B', operates 'B'	**YES**

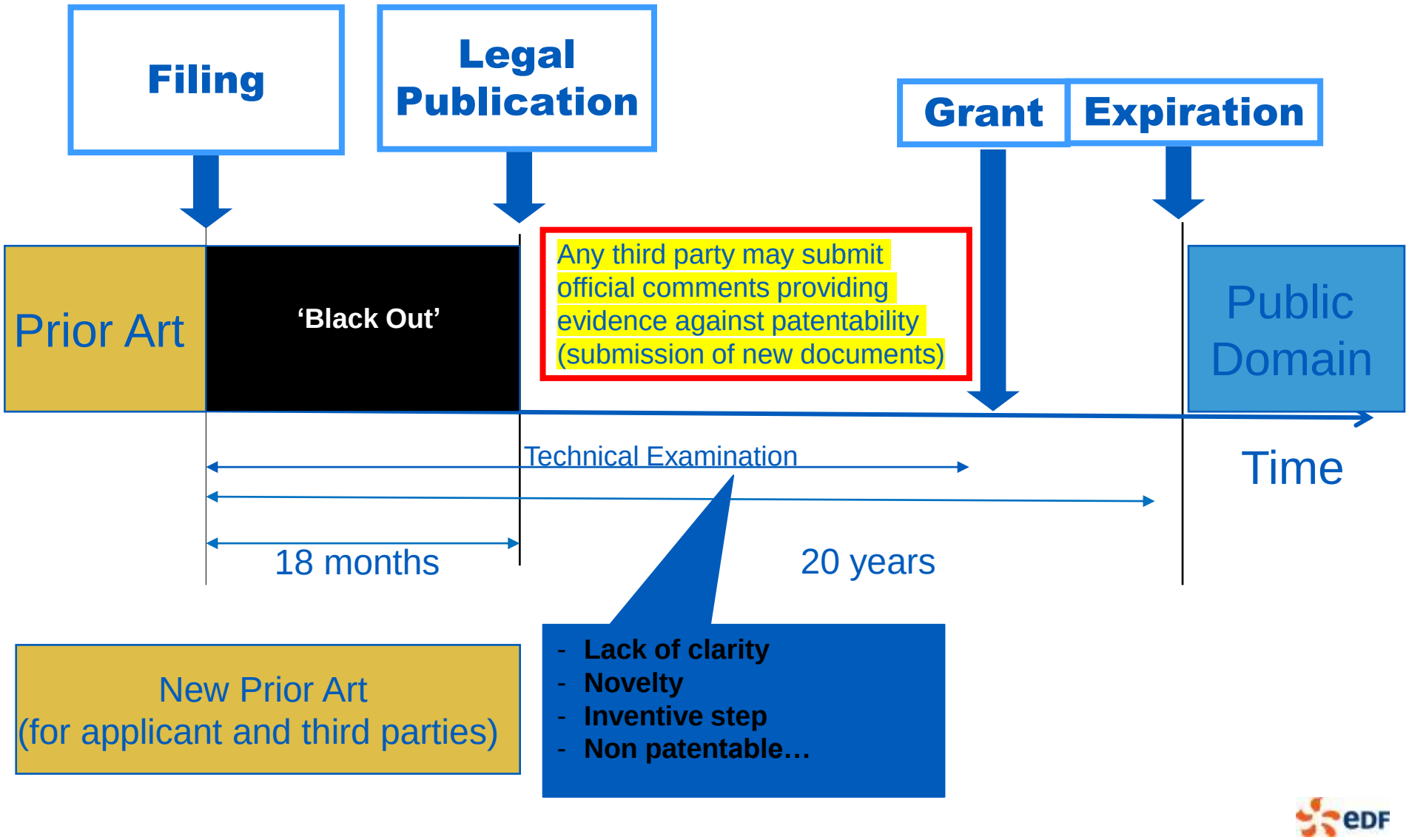
- **Perform a Freedom to OPERATE analysis of the technical solution (patented or not) against patents which could hinder**
- **If not favorable, request a license from the patent holder**

Attacking an application/ patent

CHANGER L'ÉNERGIE ENSEMBLE

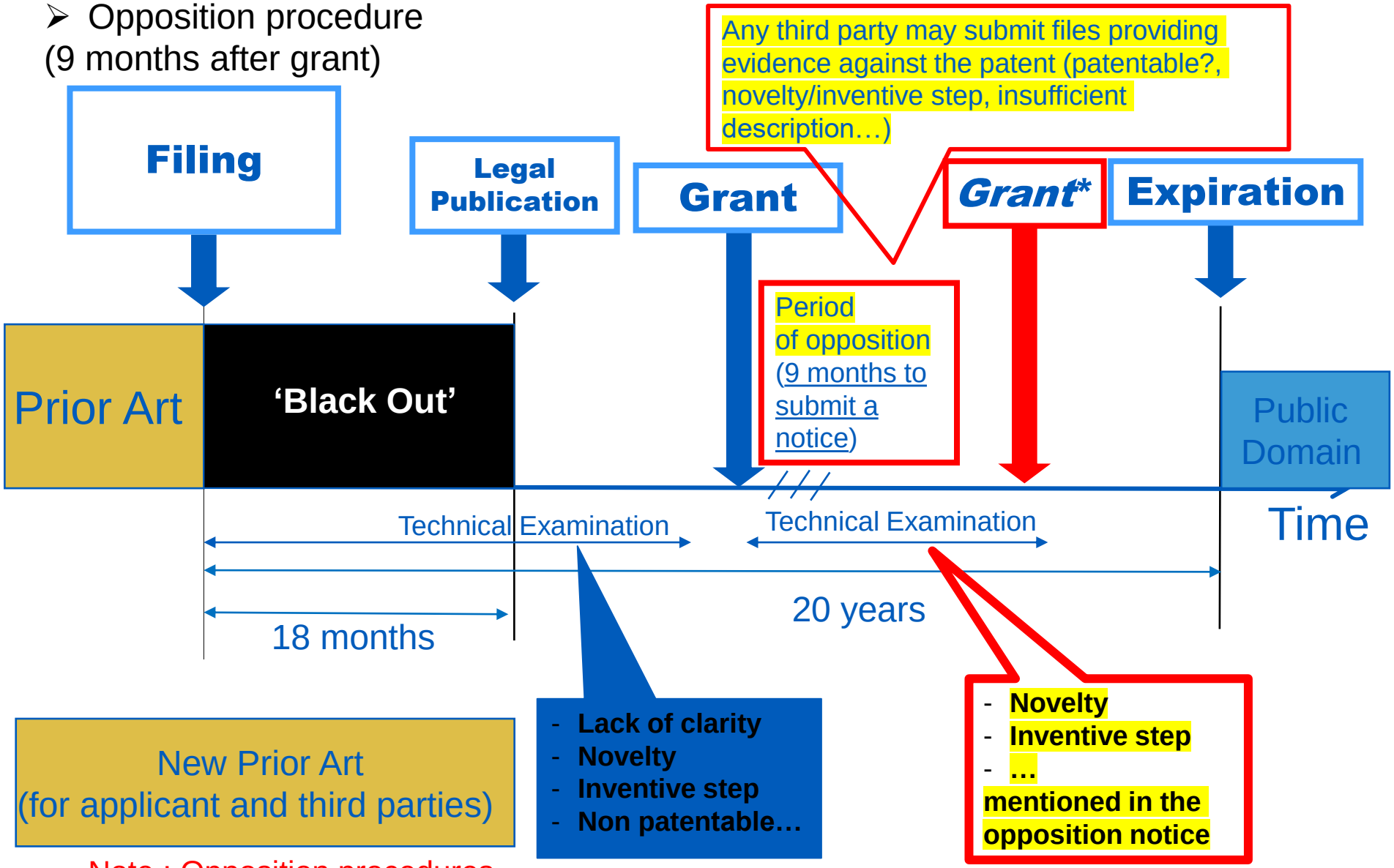
THE LIFE (or death) OF A PATENT

- Third parties comments after publication (until grant)



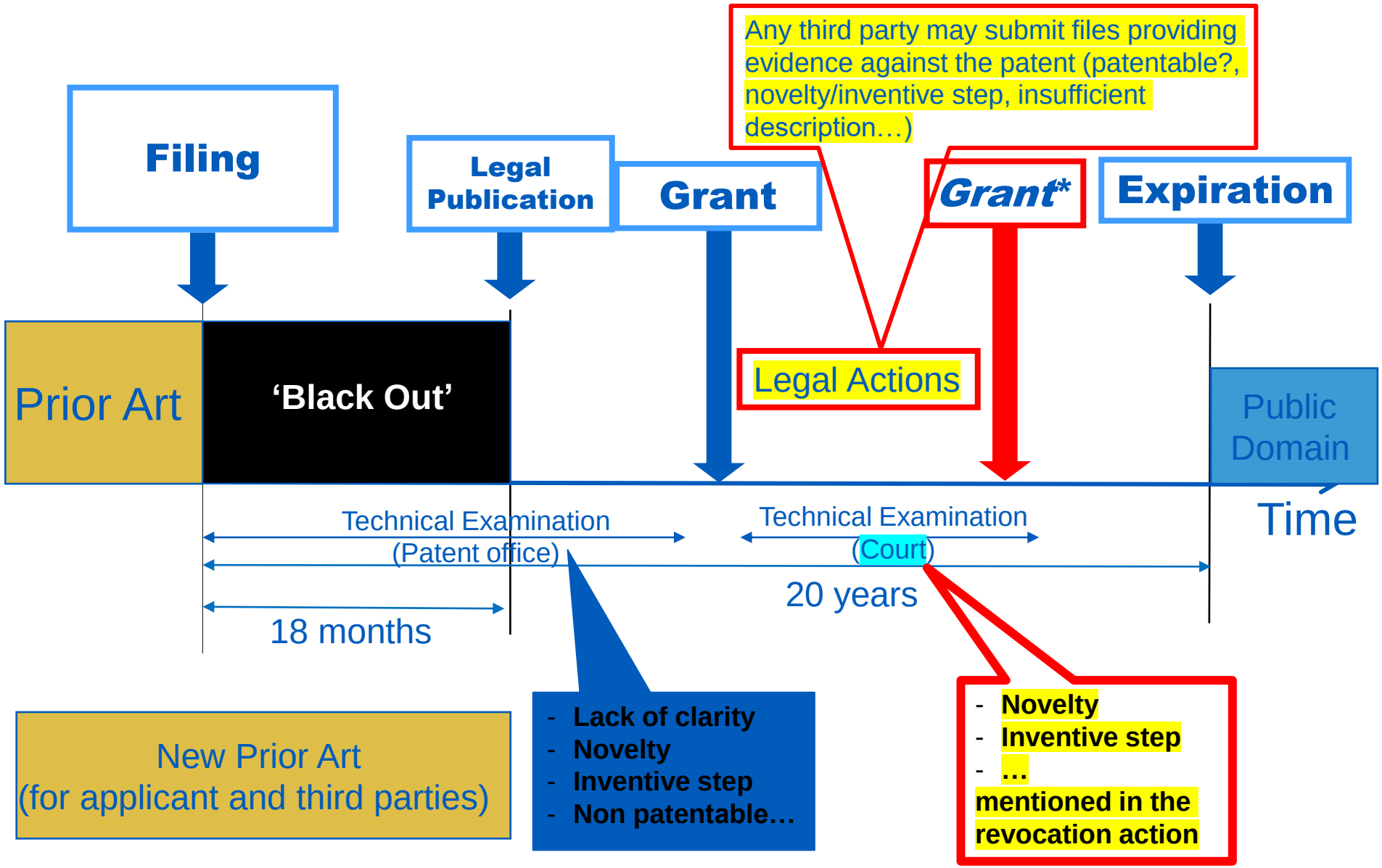
THE LIFE (or death) OF A PATENT

- Opposition procedure
(9 months after grant)



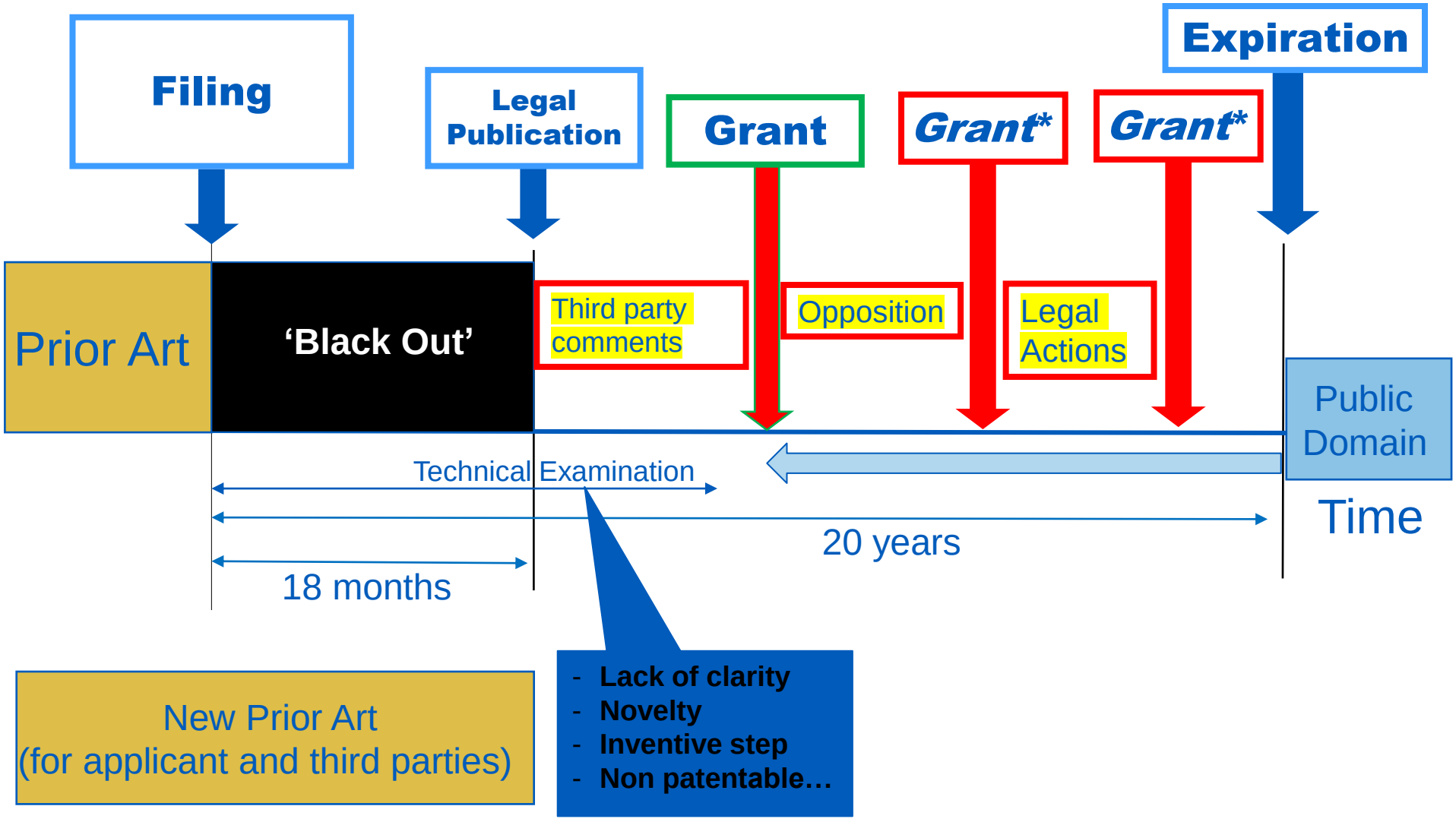
Note : Opposition procedures
- in European procedures
- in French procedures for any French application from May 2020

THE LIFE (or death) OF A PATENT



Note : Legal actions are possible only for granted national patents

THE LIFE (or death) OF A PATENT : SUMMARY



Strategies and Decisions

CHANGER L'ÉNERGIE ENSEMBLE

COST EXAMPLES

- French National patent - INPI (1 title over 20 years ...)

  Total = **€12k** of which 55% fees and annuities - 45% fees

  Annuities : *year 2 → **36 €;** year 19 → 760 **€***

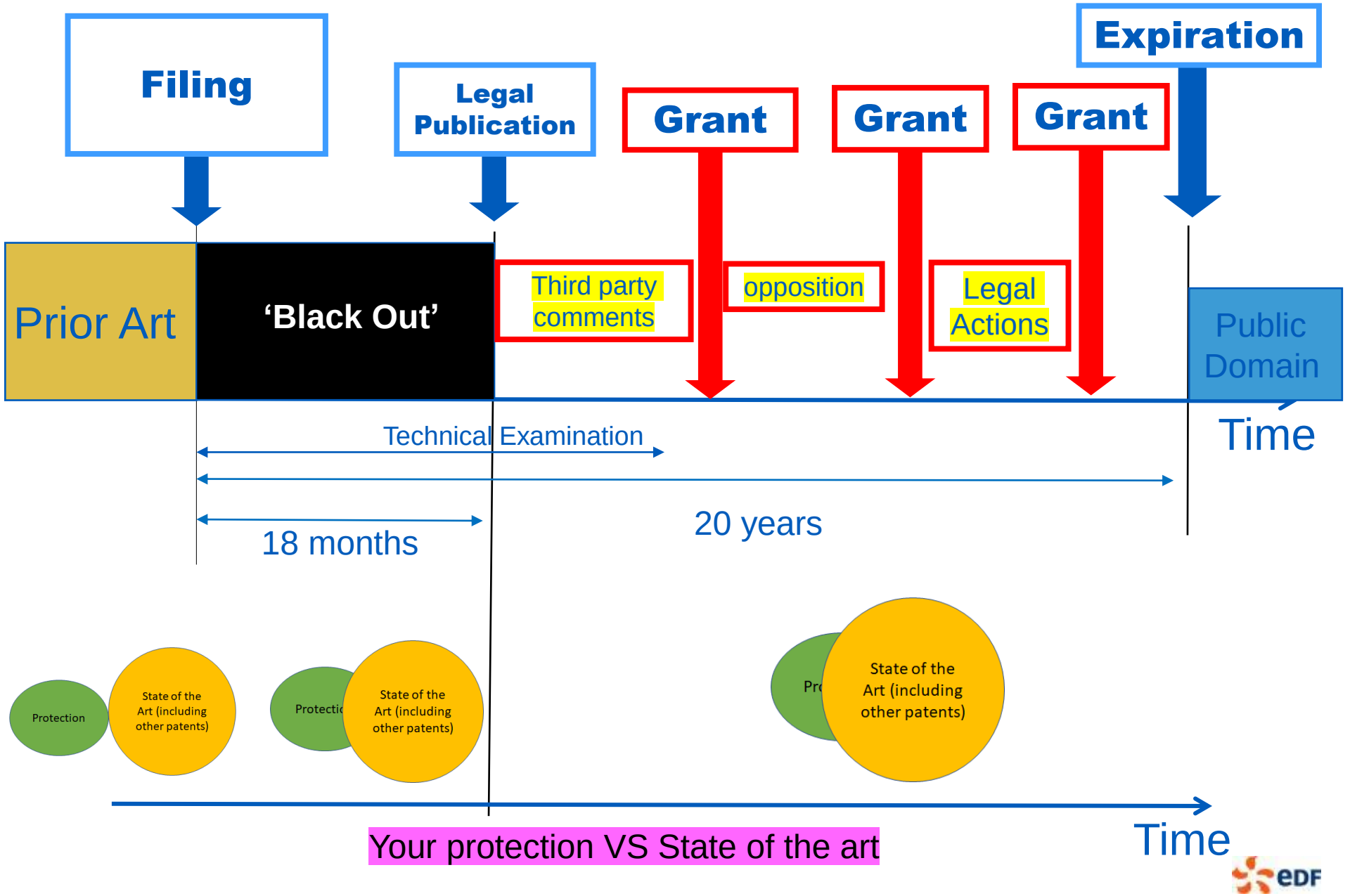
- For a patent that has been extended in IP5 countries (USA, China, Europe, Japan, South Korea)

  Costs **between €1.5 and €2.5 k / country / year**

  (including fees, examination costs and other miscellaneous fees)

Example 10 countries (outside Europe) over 15 years: between approximately €230k and €380k

THE LIFE OF A PATENT



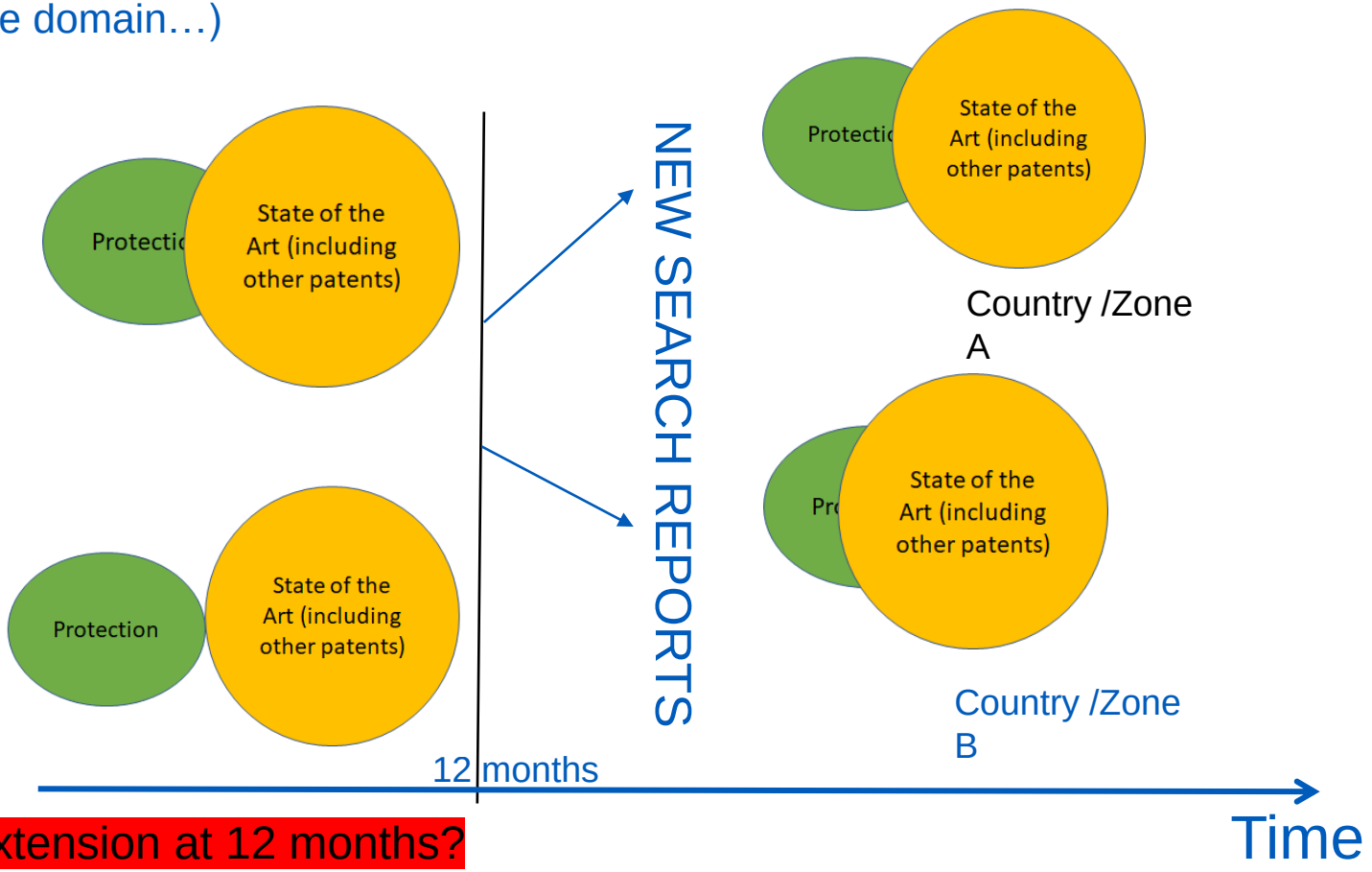
- EXTENSIONS?

How

- Direct extensions, PCT (extra 16 months needed)?

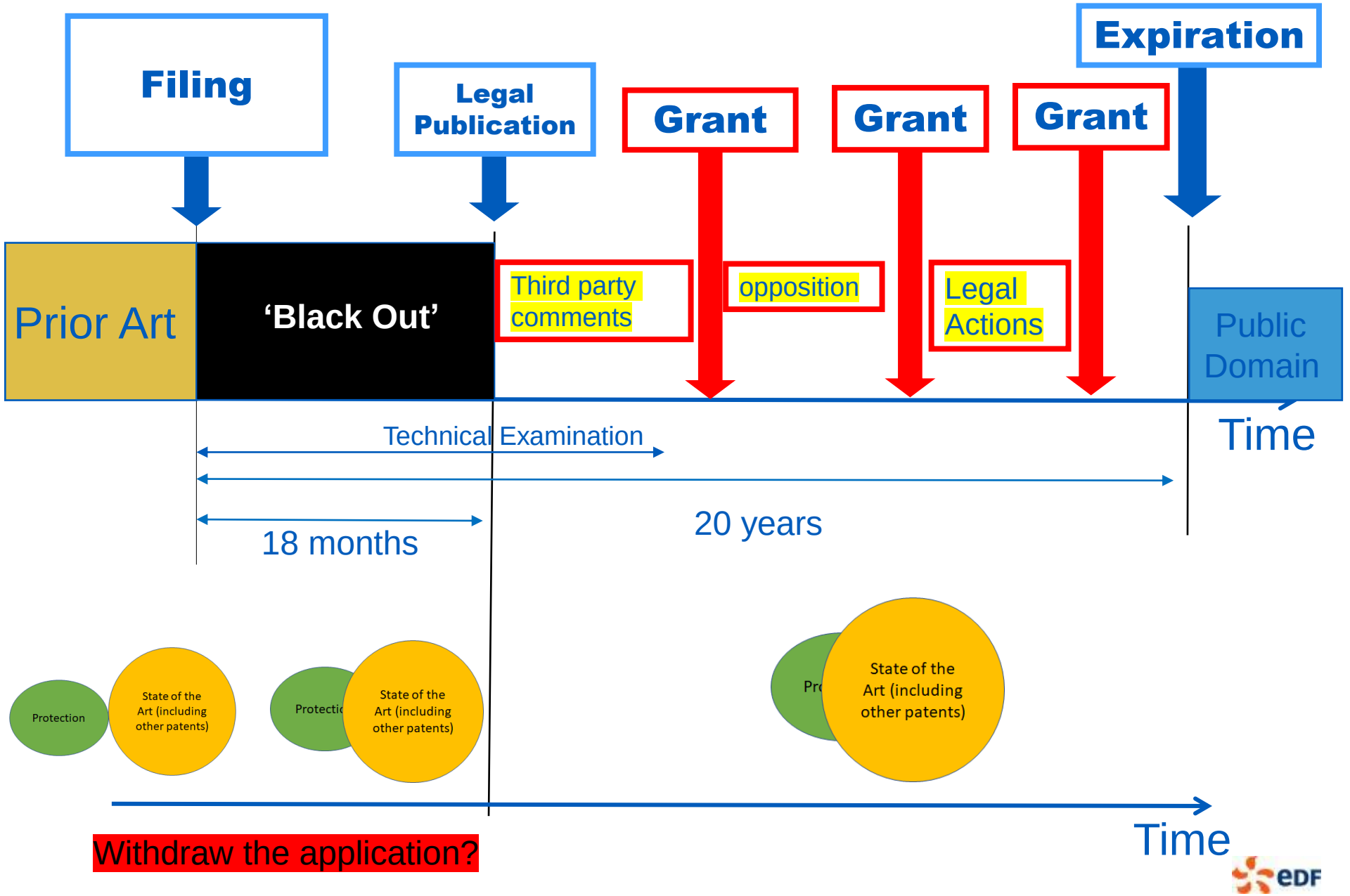
In which country(ies) ?

- Possible exploitation of the patent in support of a strategy
- Where the patent could hinder third parties (licenses, assignments)
- Country examination policies (use of previous search reports, severity, number of applications in the domain…)

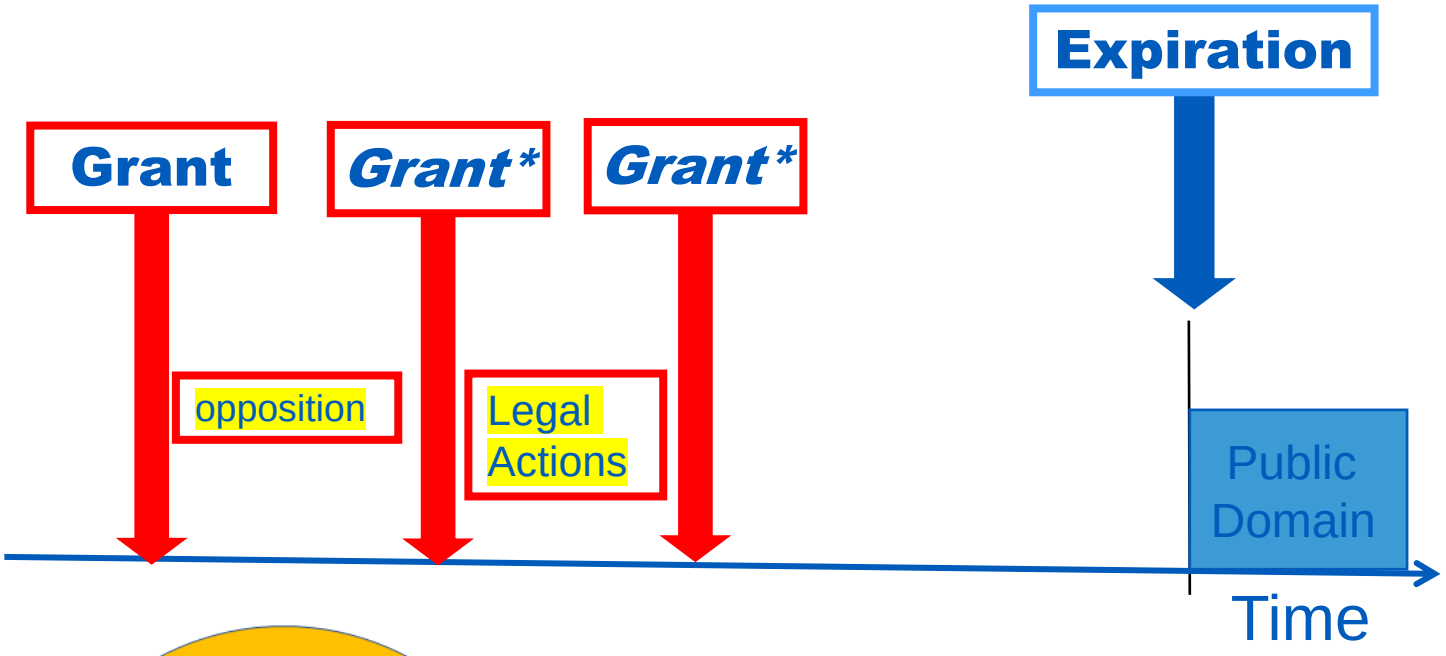


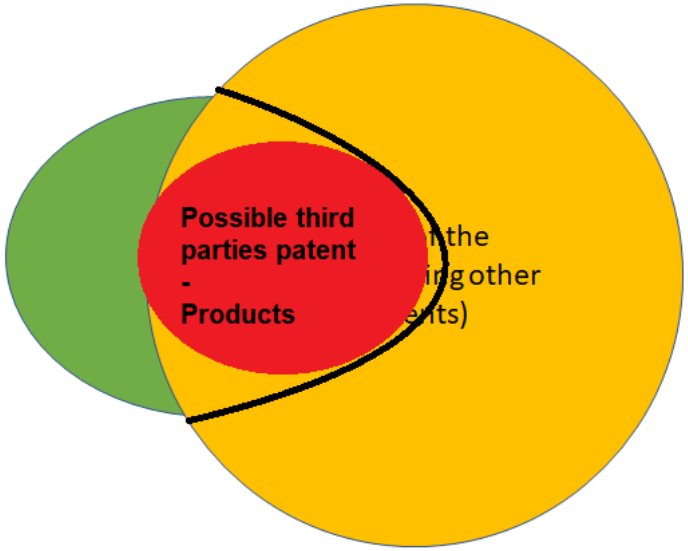
Extension at 12 months?

- BEFORE 18 MONTHS



- AFTER 18 MONTHS (PUBLICATION) and POST GRANT





- Continue the procedure and defend yourself ?
- Refine the scope of the claims?

- Protection reinforcement VS
  - Loss of (partial-total) protection (dangerous if you have products on the market);
  - Loss of potential infringers (loss of potentials licenses);

THANK YOU!

QUESTIONS?

CHANGER L'ÉNERGIE ENSEMBLE

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- https://www.epo.org/en/legal/epc/2020/convention.html