



Adaptation to Climate Change What are feasible Strategies?

**The French LACCAVE project ;
Finding a strategic response to climate change including all
stakeholders of the wine industry**

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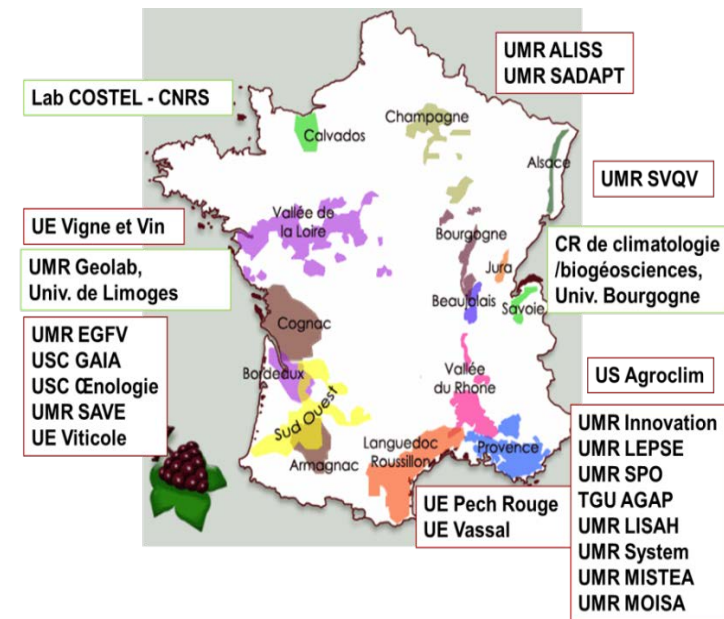


In the frame of Laccave project

« Long term impacts and adaptation to climate change of the french wine industry »

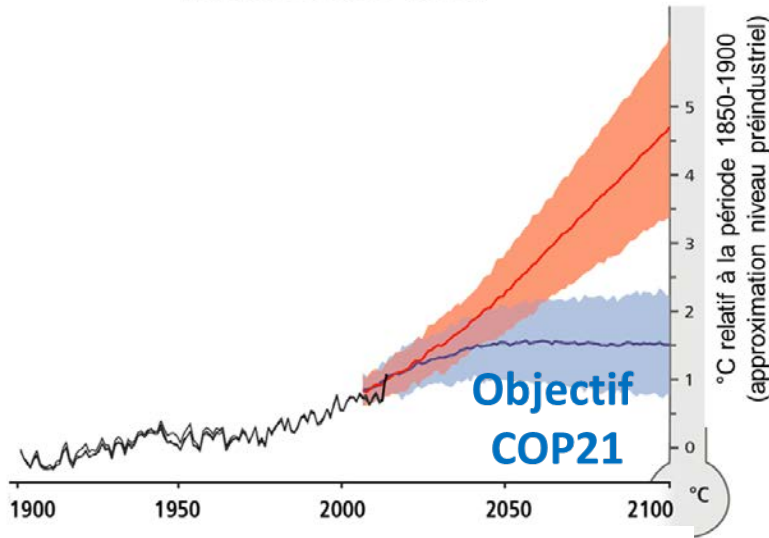


- A scientific network with 23 laboratories and state organisations for the defense of Agriculture and Appellations of Origin
- Disciplinary studies about impacts and adaptation levers
- A foresight exercise to develop a multidisciplinary approach, raise the awareness of the industry and help it to make decisions in the context of climate change



Climate Change observed, simulated

Evolution de la température moyenne de la surface du globe
(GIEC 2013 et NCDC 2016)



1. Average **temperature increasing**

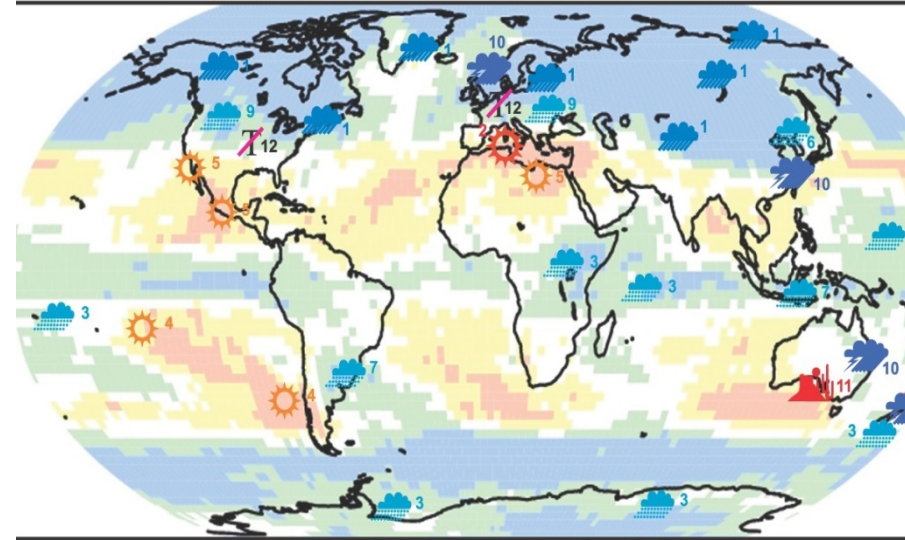
observed : + 1,4°C en France
from +1°C to +2°C en 2050
up to + 5°C en 2100

Depending on gas emissions

3. Increasing climate **variability** **summer droughts getting stronger**

Interannual variations

Extreme events : tempests, « canicules », ...



2. Modification of **rains**

Few impacts observed but
increasing in northern Europe
decreasing in southern Europe

4. **Various indirect effects**

sea level, salt concentrations

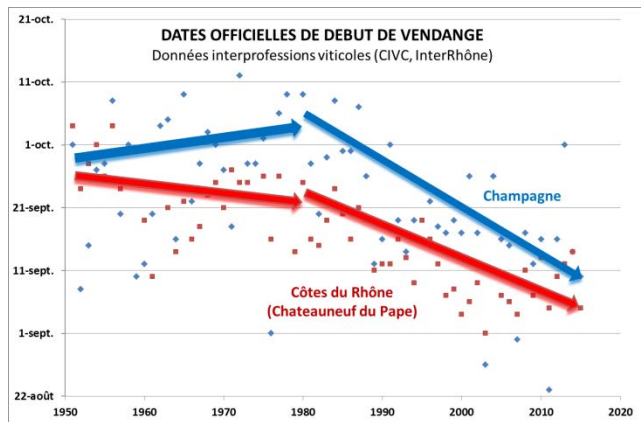
loss of biodiversity

Microorganismes, pests and diseases

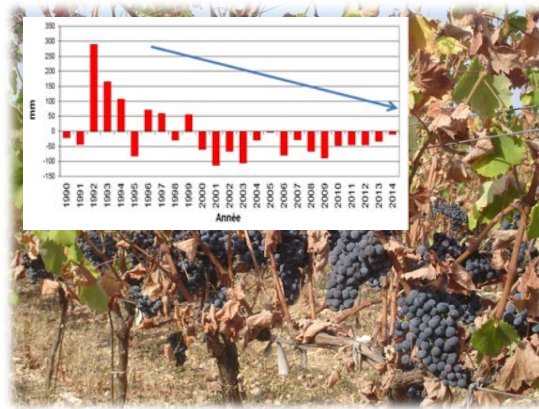
Ecosystèmes, soils and landscapes...

Impacts of climate change on vine and wine

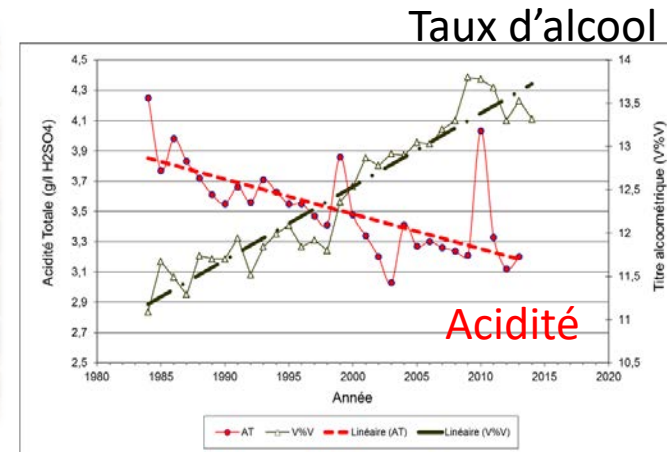
observed, simulated, felt



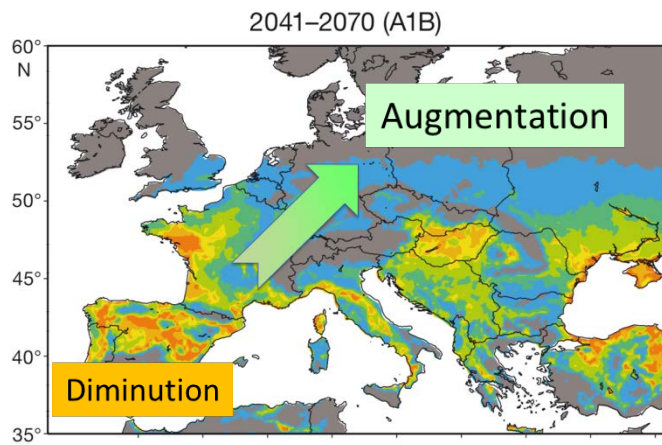
phenology : earliest
harvest dates



Balance and hydric stress
(yield, quality)



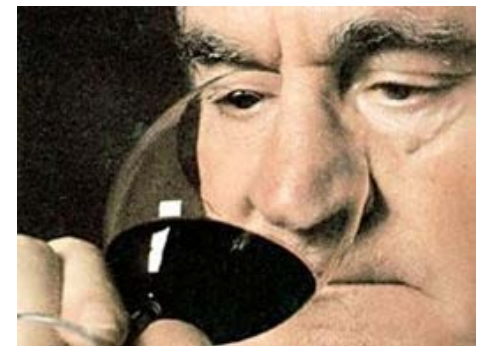
Characters of wines,
alcohol, acidity, aromas



Evolution of vine and wine
production areas



Incomes, economic risks
Competitiveness of vineyards



Tensions upon AOP?
Effects on consumers?

Research works on six main domains for adaptation

Understanding process, exploring solutions...



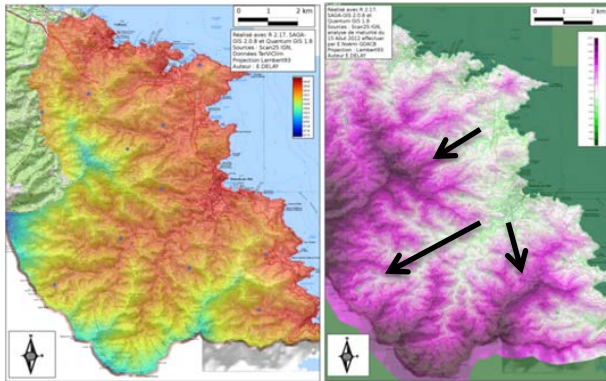
Thèses A. Coupel-Ledru, L. Rossdeutsch
Change varieties and rootstocks
(clones, old ones, foreigners, new ones)
latests, résistant to temperature, drought



Thèse E. Neetheling
New practices on vine
Pruning, soils, irrigation
digital tools, agroecology



Thèse V. Tilloy
Innovations in enology
Desalcoholisation, acidification
température, yeasts



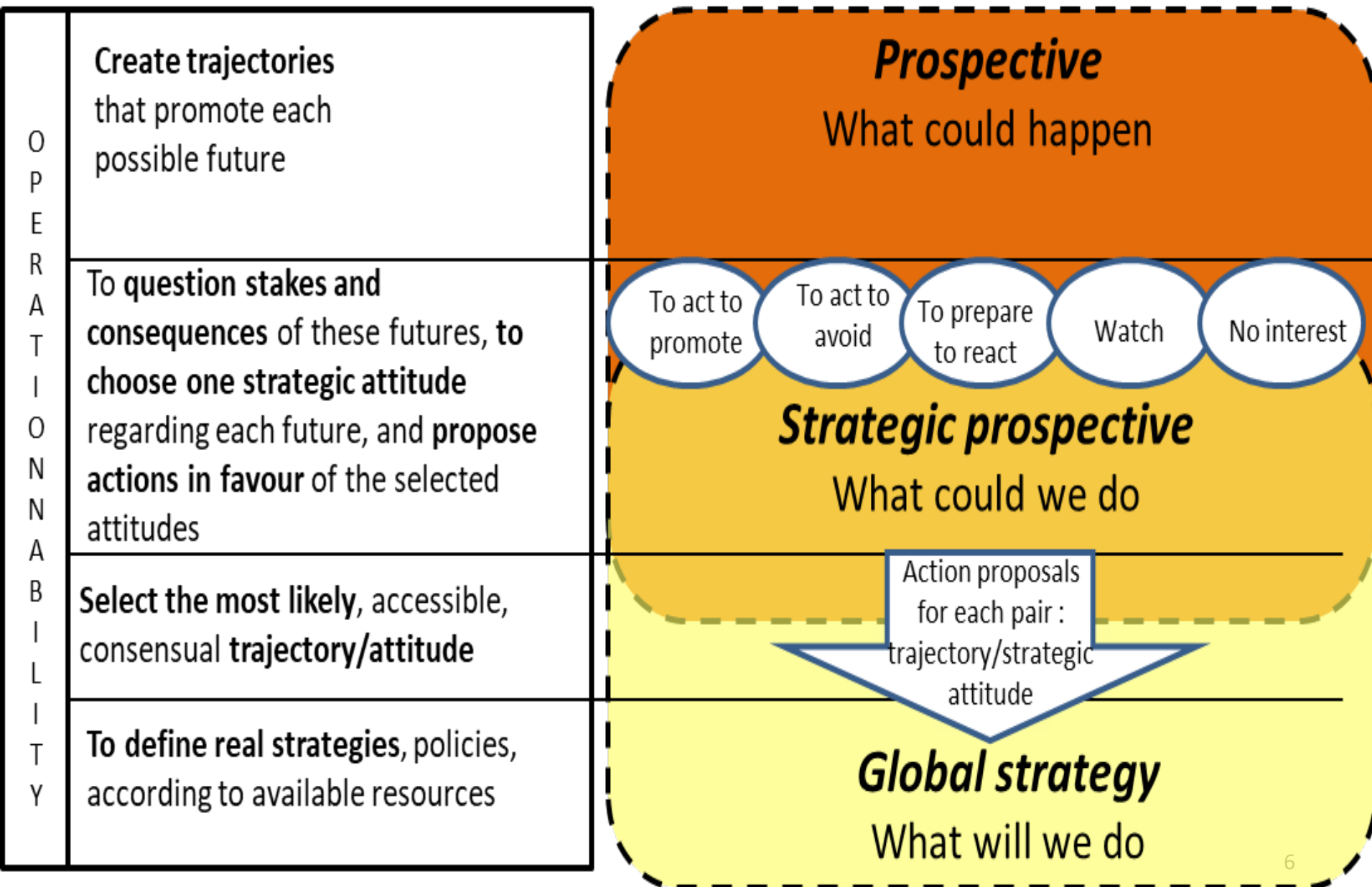
Thèse E. Delay
Re-organise plantations in terroirs
Choosing soils, exposition, water reserve
For new plantations



Thèse J. Boyer
Change the institutions
Specifications, insurances,
R&D policiies



Thèse A. Fuentes
Involve consumers
Acceptation, ready to pay ?
(behaviour economy)



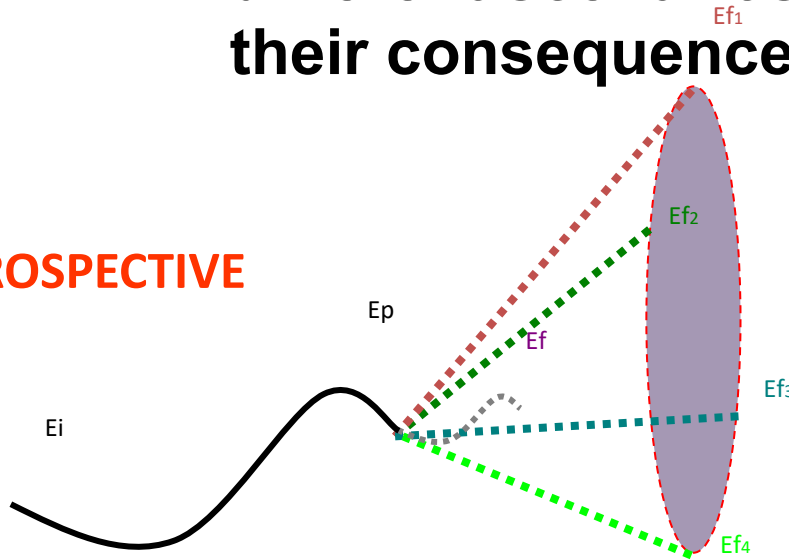


The future is not written, it can be partly built, based on the will of the actors and their organization.

Neither a simulation, nor a prevision

An interactive intellectual exercise to imagine « possible futures », based on different scenarios and the analyses of their consequences

PROSPECTIVE



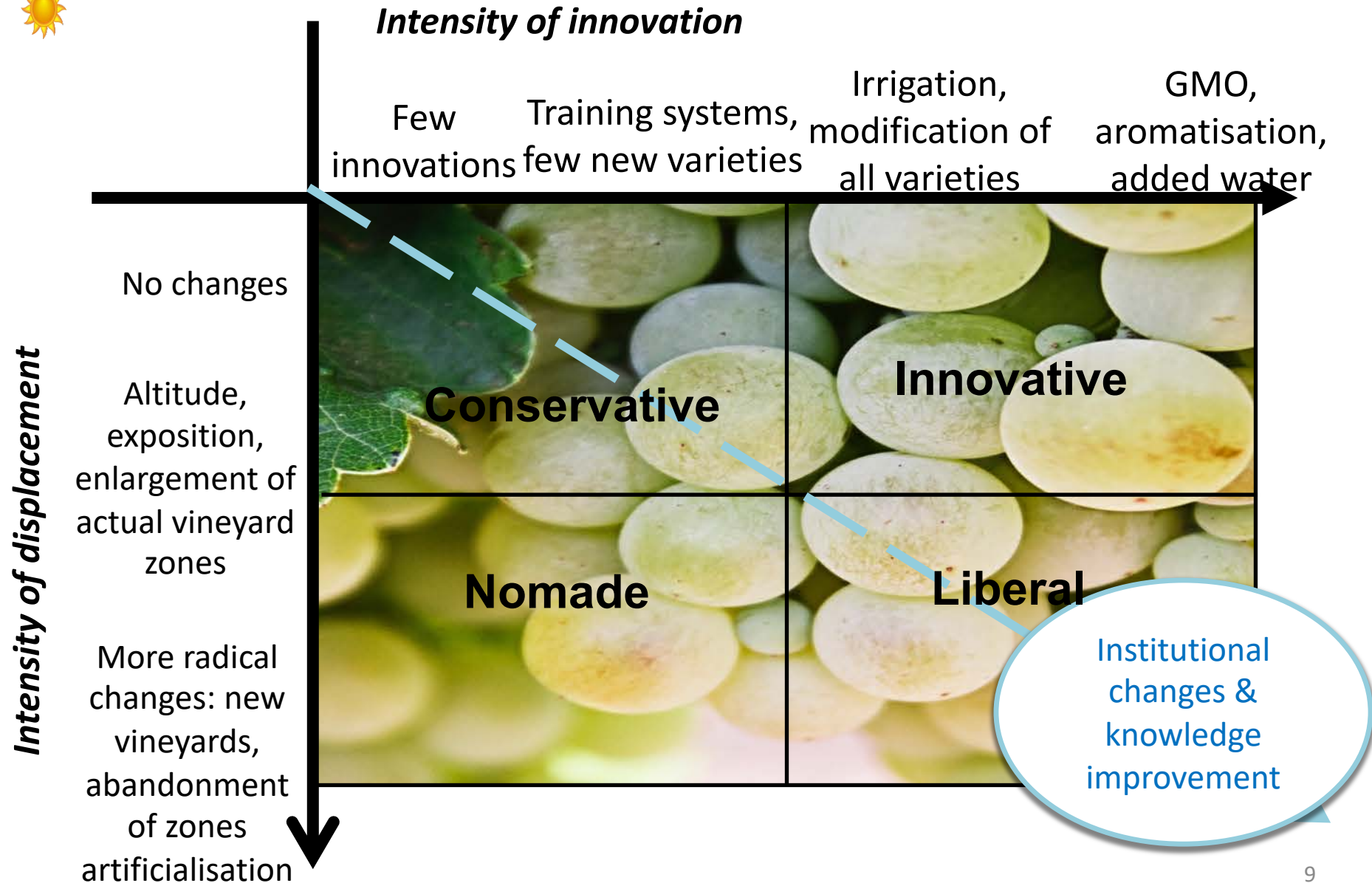
- Each scenario is a result of the combination of many hypotheses related to the context and the drivers of changes.
- Each scenario usually takes the shape as a plausible story

Identify possible futures



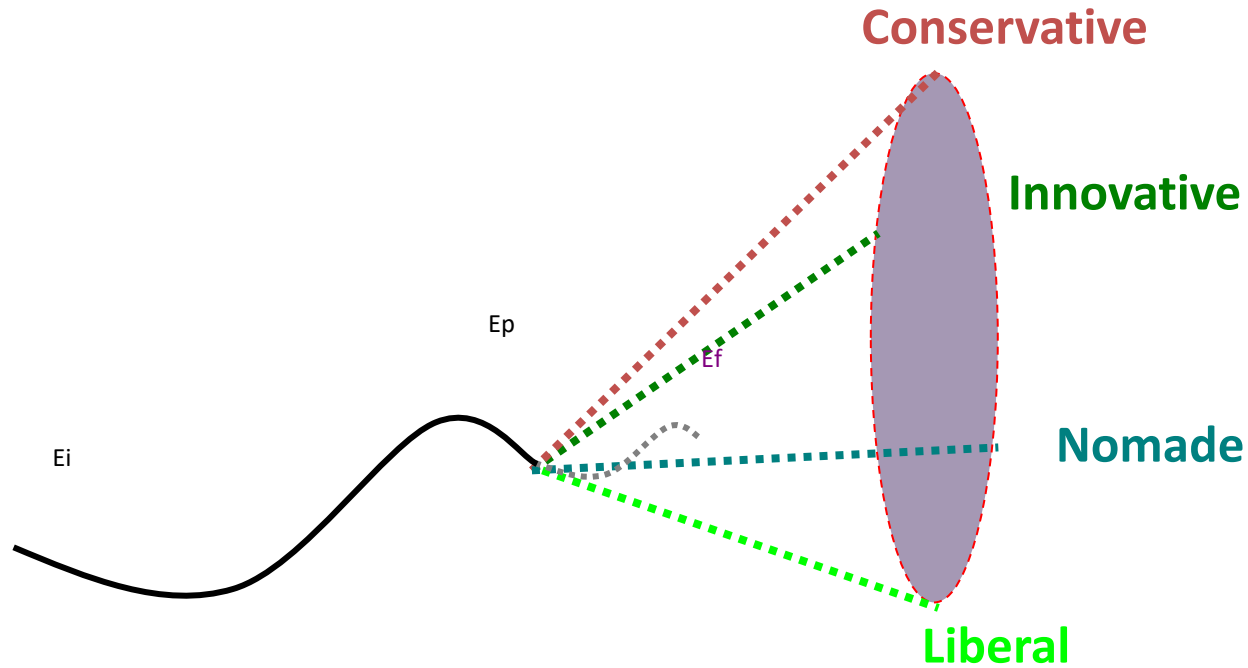
Climatic scenario RCP 4,5

- + 2°C
- No important changes in precipitation, but an increase of grapevine water requirement
- Moderate increase of extreme events
- Various impacts in North and South
 - North : favorable impacts for maturity and yield, modification of wine types with less acidity, increased sanitary issues for vines
 - South : drought, lack of freshness, ripening under too warm conditions, new types of wines with high alcohol content





Main drivers of adaptation



- **70 key hypotheses** : technical, political, economical, internal or external, strong or weak drivers
- **1 trajectory** (story) to reach 1 possible future

A participative approach to evaluate what could be done



**7 meetings with actors of the industry
in 7 wine regions :**

**Bordeaux, Champagne, Burgundy, Languedoc,
Côtes du Rhône, Alsace, Val de Loire**





60-100 participants per meeting
Small working groups, interactive tools



- 1. Analyse **stakes and consequences** of each future/trajectory (per working group)
- 2. Choose one **strategic attitude** per future/trajectory (on individual basis)
(act to promote, act to avoid, prepare to...)
- 3. Propose **actions levers** in favor of the elected attitude (on individual basis)



Stakes and consequences of each strategy as perceived by actors



		
Conservative	<ul style="list-style-type: none">• Valorisation of diversity• Environment• French industry as a reference	<ul style="list-style-type: none">• Decrease of yield and uneven quality• No technical improvement• High price of wines• Loss of competitiveness



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Innovative	<ul style="list-style-type: none"> • Innovations in many fields : plant material, oenology, marketing, packaging, services, types of wines, data-based • Combinations of viticulture types : classical, organic, precision • Modification of specifications for AOC 	<ul style="list-style-type: none"> • Need of fundings • Replacement of traditional investors by new ones • Loss of historical references • Loss of influence of AOP system



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Nomade	<ul style="list-style-type: none"> • Opportunities for new combinations of soil/climate/varieties/practices • Opportunities for new markets • New actors • Enlargement of irrigated area 	<ul style="list-style-type: none"> • Fragility of traditional vineyards and associated activities (oenotourism) • High risks for quality • End of AOP system • Brand based system • Concentration of private actors : marketing, extension services, vineyards

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Liberal	<ul style="list-style-type: none"> • Less administrative load • Innovations support yield and quality • New wines, markets, consumers, jobs, investors • Private support for extension services 	<ul style="list-style-type: none"> • Exclusion of small producers from private services • Industrialisation and loss of diversity, typicity • End of AOP system, less vineyards on hillside spots • Modifications in governance with loss of influence by growers • Concentration of growers, salers, wine making units



Percentage of each strategic attitude for each possible future

419 voters	To act in favour	To act to avoid	To prepare to react	Watch	No interest
Conservative	21	30	30	16	3
Innovative	73	3	22	1	1
Nomade	3	39	29	26	2
Liberal	5	59	16	18	2

A balanced choice depending on vineyard situation and resilience

A large majority in favor of innovation with a clear message
« Innovate to stay in place »

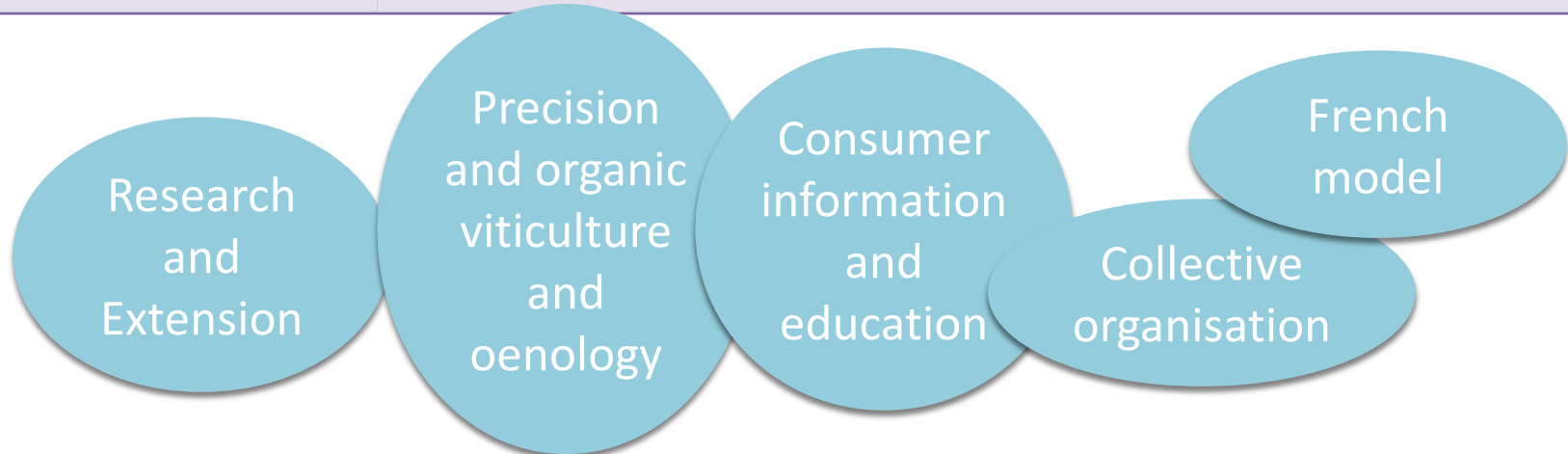
Large rejection and fear that the french model may disappear !

A rejection, but its development should be monitored

More than 2000 proposals to implement these strategic attitudes



	To act in	Number of proposals	Types of proposals
Innovative	+	559	<ul style="list-style-type: none">• To work in favour of research and extension : resistant varieties resistant to diseases, adapted to drought, irrigation, dealcoholisation, mecanisation, new products, locally adapted• To work on precision viticulture and oenology without or with irrigation, and organic viticulture• To inform and educate consumers about new types of vines, and acceptance of new technologies• To reinforce collective organisations to maintain the french model of family viticulture



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Nomade	-	224	<ul style="list-style-type: none">• To study existing terroirs and areas at the border of AOP classified zones to evaluate their potential• To develop research and extension services in order to maintain actual terroirs• To re-inforce collective actions and policies to defend terroirs and avoid de-regulation on this issue• To develop communication about the positive impacts of the industry in relation with terroir : jobs, landscape, economy, culture

Terroir study
and
protection

Marketing
based on
terroir

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Liberal	-	308	<ul style="list-style-type: none"> To develop the control and the involvement of producers on extension services, AOP and industry management To save the definition of wine and its strong territorial link To create strong brands with a leadership in AOP, to communicate on the link with terroir To maintain regulations and support (young) producers who wish to access to the land

Involve of
producers in
extension policies

Save the
definition
of wine

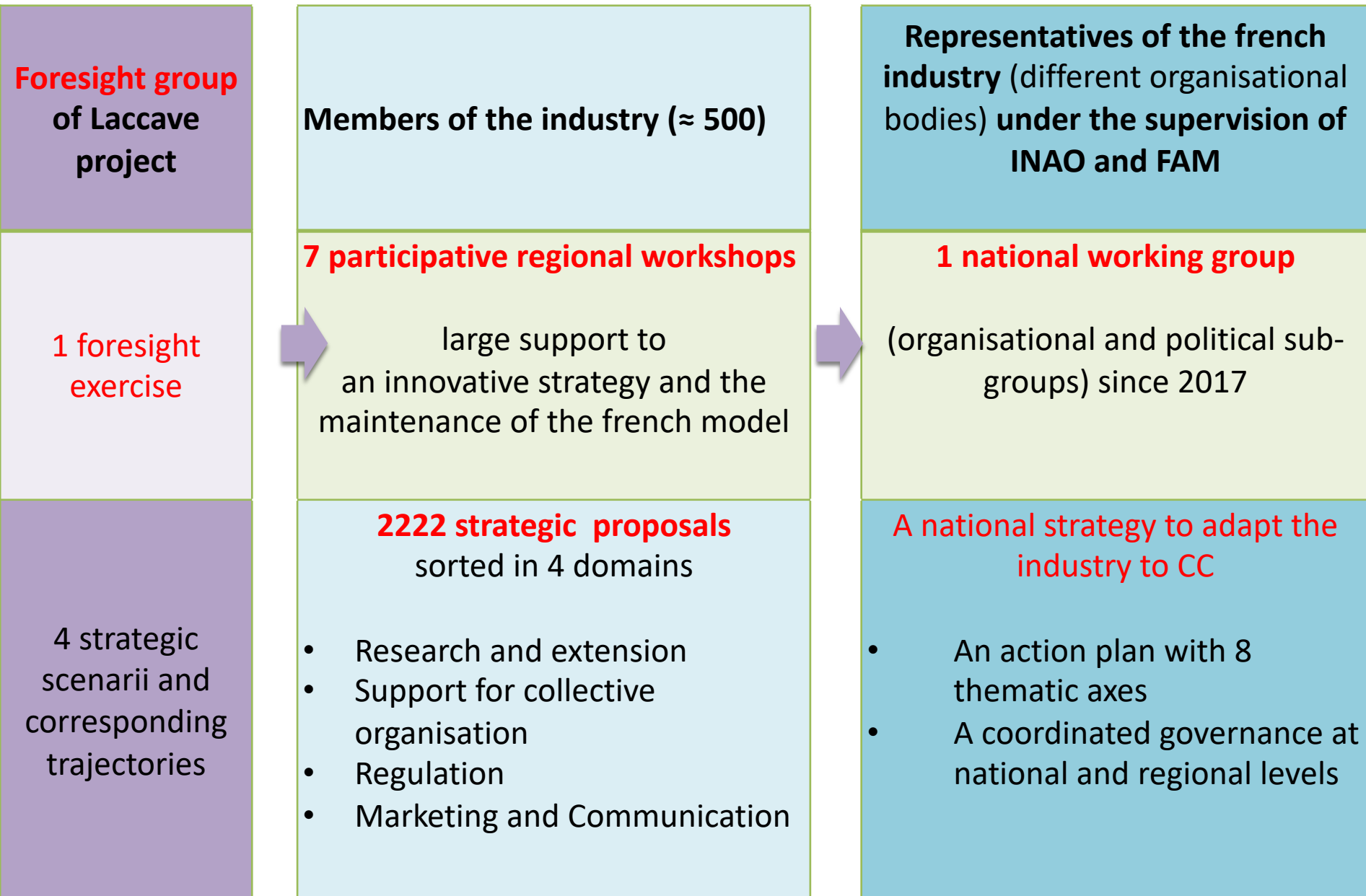
Maintain
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Support
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Terroir and environmental issues			<ul style="list-style-type: none"> To develop communication about the positive impacts of the industry on the economy, culture To develop communication about the positive impacts of the industry on the economy, culture To develop communication about the positive impacts of the industry on the economy, culture To develop communication about the positive impacts of the industry on the economy, culture
Diversity in plant material			<ul style="list-style-type: none"> To develop communication about the positive impacts of the industry on the economy, culture To develop communication about the positive impacts of the industry on the economy, culture To develop communication about the positive impacts of the industry on the economy, culture To develop communication about the positive impacts of the industry on the economy, culture
Agroecology and local know-hows			<ul style="list-style-type: none"> To develop communication about the positive impacts of the industry on the economy, culture To develop communication about the positive impacts of the industry on the economy, culture To develop communication about the positive impacts of the industry on the economy, culture To develop communication about the positive impacts of the industry on the economy, culture
Conserv + active		152	<ul style="list-style-type: none"> To improve knowledge about terroirs and improve producer awareness about environmental issues To develop the use of old varieties, clones, exogeneous varieties To develop agro-ecological practices , local know-hows, diversity To communicate about links between terroir and quality, to facilitate oenotourism, climate impacts
Conserv - active		171	<ul style="list-style-type: none"> To invest strongly and in a coordinated way with producers into research and development To inform about vineyard vulnerability to CC To support technical changes and revisit AOP specifications
To invest in R&D			
Vineyard vulnerability to CC			
Revisit AOP specifications			





« An innovative strategy to conserve the French model »

- To develop knowledge about vineyard locations and terroir
- To work on the conditions of production
- To improve the adequation between plant material and terroir
- To adapt the vinification processes
- To adapt to market evolutions
- To support Research and Development
- **To participate actively to mitigation**
- To train and to communicate with actors

Not yet
officially
delivered :

Action plan
Governance
Funding

Should be achieved in
February 2020

+ act at international levels (Tokyo 2019, OIV 2019-2020...)

2012

2019

2050



Thank you for your attention... Any questions ?

