



MANUMIX
Interreg Europe



European Union
European Regional
Development Fund

1st Learning Pillar: Innovation Policy-Mix for Advanced Manufacturing

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THE CONCEPT

Innovation Policy-Mix

A definition

*“The combination of policy instruments, which interact to influence the quantity and quality of R&D investments in public and private sectors”
Nauwealers (2009)*

- It is more than a portfolio of instruments
- Needs clarification about the concept of instruments itself:

*Policy tools or government instruments can be defined as:
(T)he actual means and or devices governments have at
their disposal for implementing policies, and among which
they must select in formulating a policy. (Howlett and
Ramesh, 2003).*

Types of policy instruments:

- Economic
 - Regulatory
 - Soft
- } *Supply or demand side*

Innovation Policy-Mix

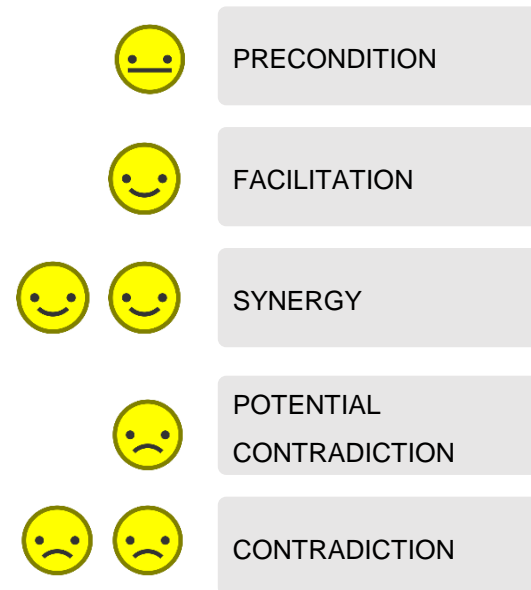
In this context, evaluation needs to evolve from capturing the effects of a single instrument to analysing the effects of a combination of instruments, which has implications on the governance of the evaluation

Types of combination

Table 1. Five types of relations among policy measures.

Relation	Description
Precondition (P)	Defined as a relation that is strictly required for the successful implementation of another policy measure. For instance, if policy measure B is a precondition to policy measure A, the successful implementation of policy measure A can only be achieved if policy measure B is successfully implemented beforehand. The precondition relation is a direct relation.
Facilitation (F)	In a case where a policy measure 'will work better' if the outcome of another policy measure has been achieved, the relation is considered as a facilitation relation. For instance, policy measure B facilitates policy measure A when policy measure A works better after policy measure B has been implemented; however, policy measure A could still be implemented independently of policy measure B. The facilitation relation is also a direct relation.
Synergy (S)	A special case of facilitation relation in which the 'will work better' relation is bidirectional (undirected relation). It can be argued that such a relation can be treated as a two-way facilitation; however, we believe that treating this relation as a separate type is advantageous, as it suggests a higher effectiveness of both of the policy measures having the synergetic relation vis-à-vis the overall policy.
Potential contradiction (PC)	A potential contradiction exists between policy measures if the policy measures produce conflicting outcomes or incentives with respect to the policy target under certain circumstances, hence the contradiction is 'potential'. This relation is undirected.
Contradiction (C)	In contrast to the conditional nature of potential contradiction, the contradiction relation is defined when there are 'strictly' conflicting outcomes of incentives between policy measures. Similar to the potential contradiction relation, this relation is undirected.

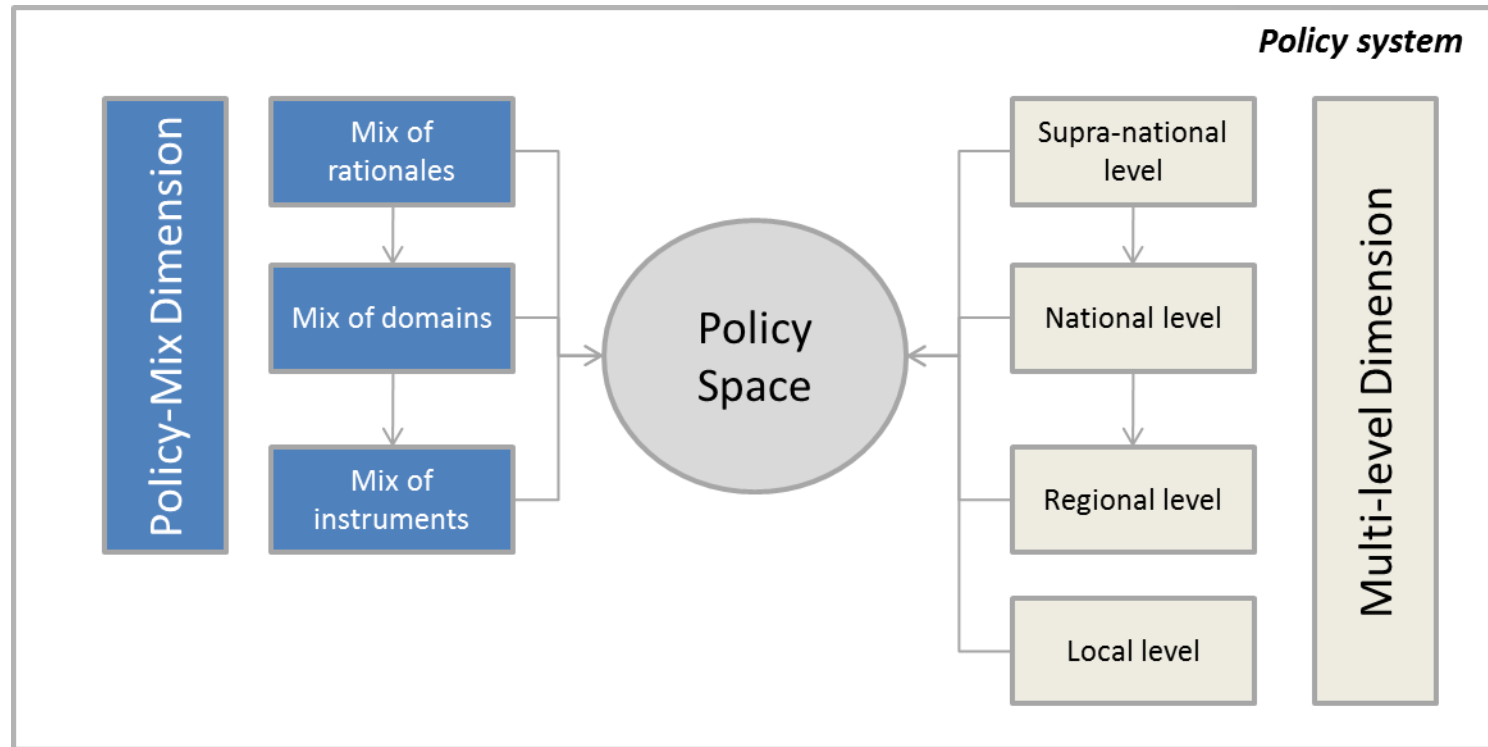
Types of interaction



Source: Tæiebag et al. 2013

Innovation Policy-Mix

Dimensions that impact on a certain system/territory



Source: Magro and Wilson (2013)

Innovation Policy-Mix in the framework of RIS3: Implication for AM strategies.

Importance of two dimensions

- 01** Verticality of policy mixes among different levels, which varies from the presence of different instruments (a policy-mix) from a single administrative level, to the presence of different instruments from different administrative levels. (Multi-level governance)

- 02** Directionality of policy mixes in terms of regional priorities, which varies from the presence of neutral instruments (a policy-mix that doesn't seek to influence the direction of innovation by prioritising specific activities/sectors/clusters), to the presence of instruments that seek to influence the directionality of innovation.

BEST PRACTICES ON POLICY- MIXES FOR ADVANCED MANUFACTURING

Regional approaches to policy-mixes: an overview.

Innovation policy-mixes for AM are conditioned by regional approaches to policy-mixes

Regional differences with regards policy-mixes:

FOCUS ON BUSINESS SUPPORT

- Grants, loans and venture capital to support business innovation (DE, FR, AT, BE, ESP, IT, most regions in UK). Low share of European funds.

FOCUS ON SCIENCE-INDUSTRY COLLABORATION

- Mainly grants and larger share of EU funds (DE, IT, FR, NL, SE, CZ, GR).

FOCUS ON INNOVATION CLIMATE AND ECOSYSTEM

- Large share of EU funds. Grants, loans and venture capital (IT, FI, FR, DK).

PUBLIC R&D INVESTMENTS AND COMPLEMENTARY ACTIVITIES

- Notable share of EU funding. Focus on grants and support on public R&D complemented by business R&D and science-industry collaboration (IT, ES, SE, FR, HU, PL).

HOLISTIC APPROACH, INCLUDING SOCIAL CAPITAL.

- Less developed regions that focus on business R&D and innovation complemented by other measures. Mainly by grants (IT, ES, HU, PL).

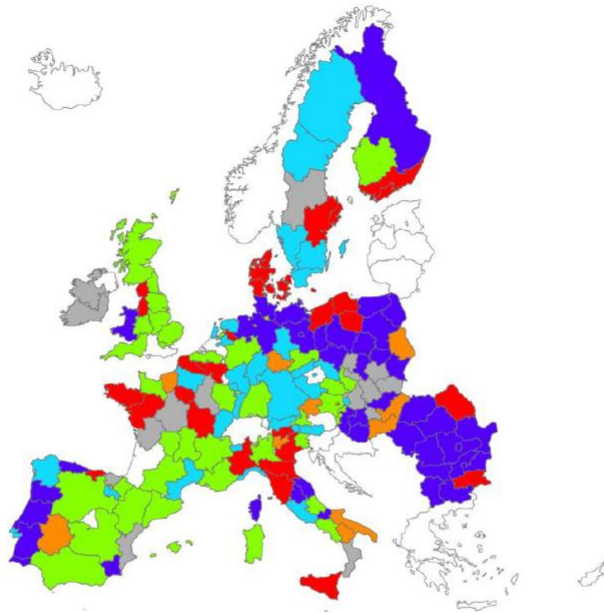
CONVERGENCE CLUSTER

- High rate of EU funds. Only use of grants and main focus on business R&D and innovation.

Regional approaches to policy-mixes: an overview.

Innovation policy-mixes for AM are conditioned by regional approaches to policy-mixes (II)

Typology of regions



- green: business-oriented
- turquoise: science-industry collaboration
- grey: public R&D investment & complementary
- red: innovation climate & ecosystem
- orange: holistic approach incl. human resources
- violet: Convergence cluster

Source: Kroll (2016)

Effective innovation policy-mixes seem to combine:

- Direct and indirect measures for R&D in firms (subsidies plus tax incentives) (Cunningham *et al.*, 2012)
- Instruments that combine technology push and pull (supply and demand side) for specific domains/technologies (Buen, 2006) over time.

BASQUE COUNTRY

PUBLIC INVESTMENT
& COMPLEMENTARY

PIEDMONT

INNOVATION CLIMATE
ECOSYSTEM

WALES

CONVERGENCE
CLUSTER

Understanding challenges for Advanced Manufacturing.

Specific challenges related to Advanced Manufacturing plus traditional problems and failures related to innovation (uncertainty, lack of collaboration industry/science), justifies the need of a policy mix in this area

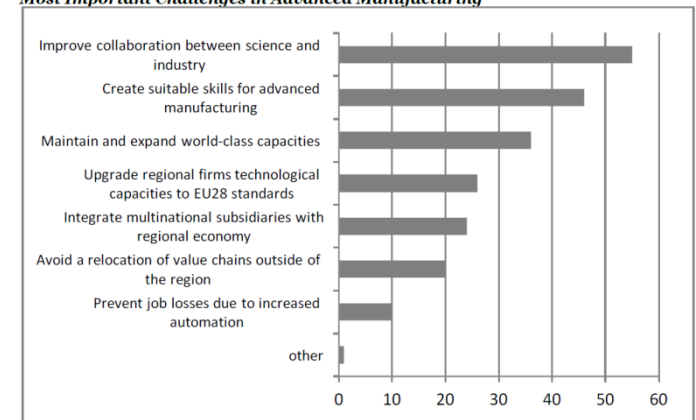
Barriers for the adoption of Advanced Manufacturing Technologies by users



Barriers for the adoption of Advanced Manufacturing Technologies by producers



Most Important Challenges in Advanced Manufacturing



Source: RIM Plus Thematic Report, European Commission, 2015

Policy instruments for Advanced Manufacturing.

Examples of best practices of instruments for Advanced Manufacturing still focus on individual instruments and not on policy-mixes approaches

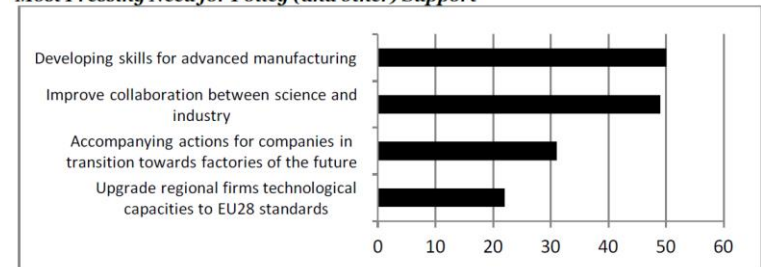
Types of measures for overcoming these barriers



Examples of best practices at different levels

		Inspiring existing examples addressing derived shortcomings			
		Regional Level	National Level	European Level	Outside the European Union
Shortcomings derived from critical analysis	Fragmented policy actions	<ul style="list-style-type: none"> Innovation Voucher (Lombardy) GLOBALmidt (Central Denmark) VINCI (Salzburg) 	<ul style="list-style-type: none"> Cluster Fabbrica Intelligente (Italy) 	<ul style="list-style-type: none"> INNOSUP INTERREG IV INTERREG MED 	<ul style="list-style-type: none"> Made in China 2025
	Limited number of initiatives for uptake of AMT in SMEs	<ul style="list-style-type: none"> RENOVE Maquinaria (Basque Country) 	<ul style="list-style-type: none"> RobotstartPME (France) 	<ul style="list-style-type: none"> ActPhast I4MS 	<ul style="list-style-type: none"> SBIR STTR
	Difficulty in access to pilot infrastructure			<ul style="list-style-type: none"> Vanguard Initiative 	<ul style="list-style-type: none"> NNMI
	Lack of mid-range universities linked to SMEs	<ul style="list-style-type: none"> DHBW (Baden-Württemberg) 	<ul style="list-style-type: none"> Steinbeis (Germany) FHprofUnt (Germany) 		<ul style="list-style-type: none"> MEP

Most Pressing Need for Policy (and other) Support

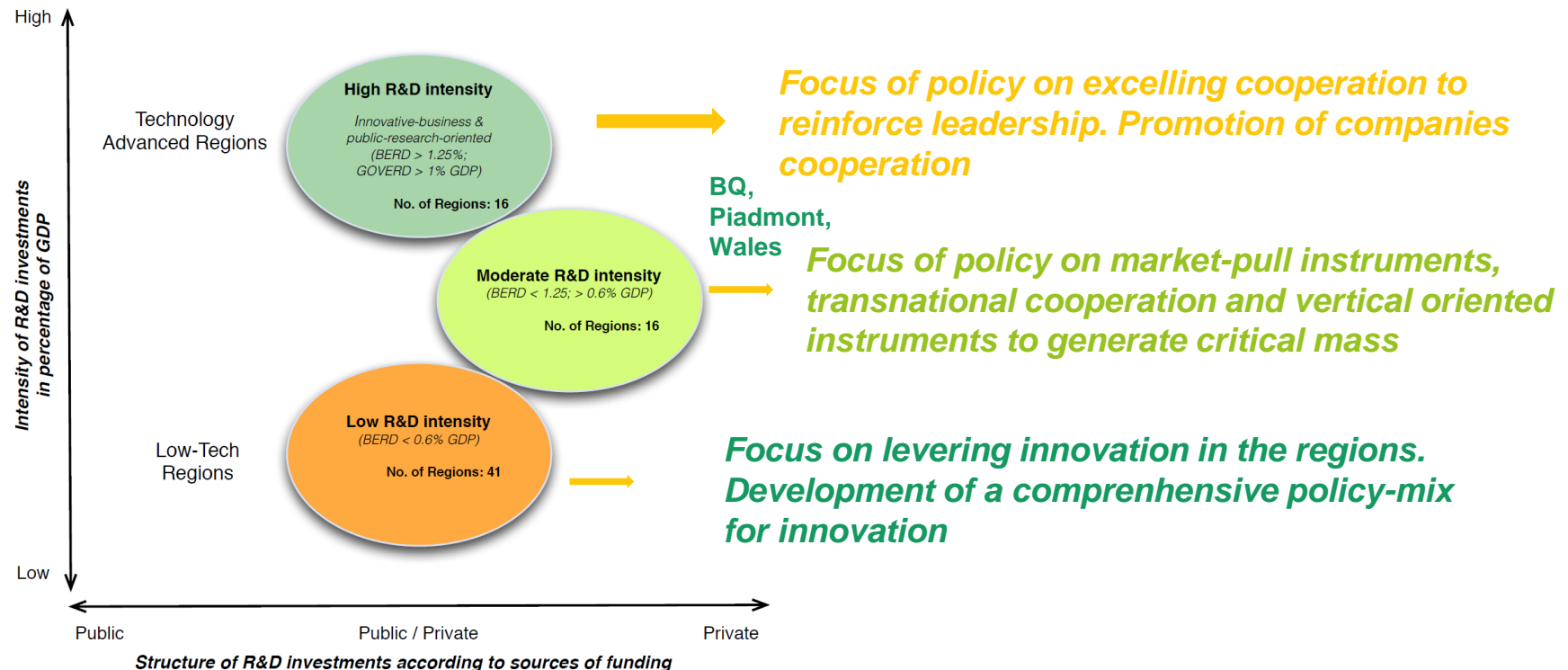


Source: Rim Plus Thematic Report, European Commission, 2015

Policy instruments for Advanced Manufacturing.

The type of region and industry condition the focus of policy in AM

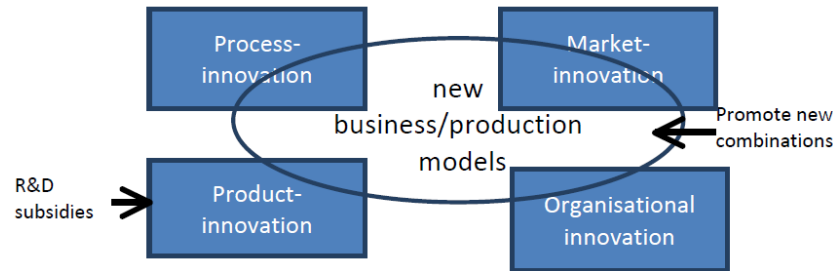
Typology of regions and instruments:



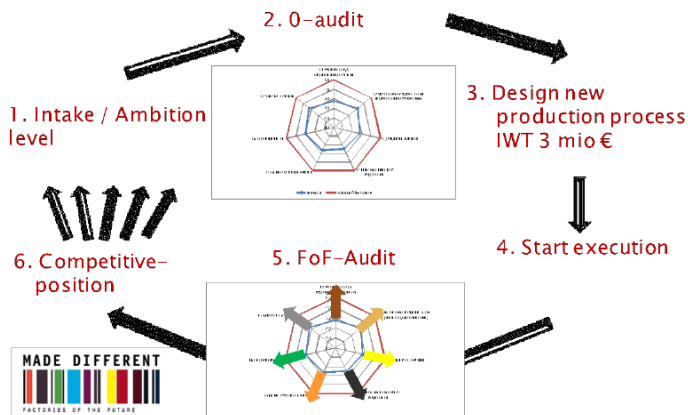
Best practices of innovation policy portfolios for AM.

Examples of best practices of policy portfolios combine public-private support and go beyond traditional R&D instruments

NEED TO COMBINE INSTRUMENTS TARGETING DIFFERENT INNOVATION RESULTS



Factory of the future: Flanders



Last steps are non- government funded:
Valley of Death.

LimburgMarkets programme



WALES AS A BEST PRACTICE OF POLICY MIX

Source: RIM Plus thematic paper, European Commission, 2014

INNOVATION POLICY-MIX IN THE MANUMIX REGIONS

A DEEPER UNDERSTANDING OF THE SITUATION IN EACH REGION (MINI-MIX)

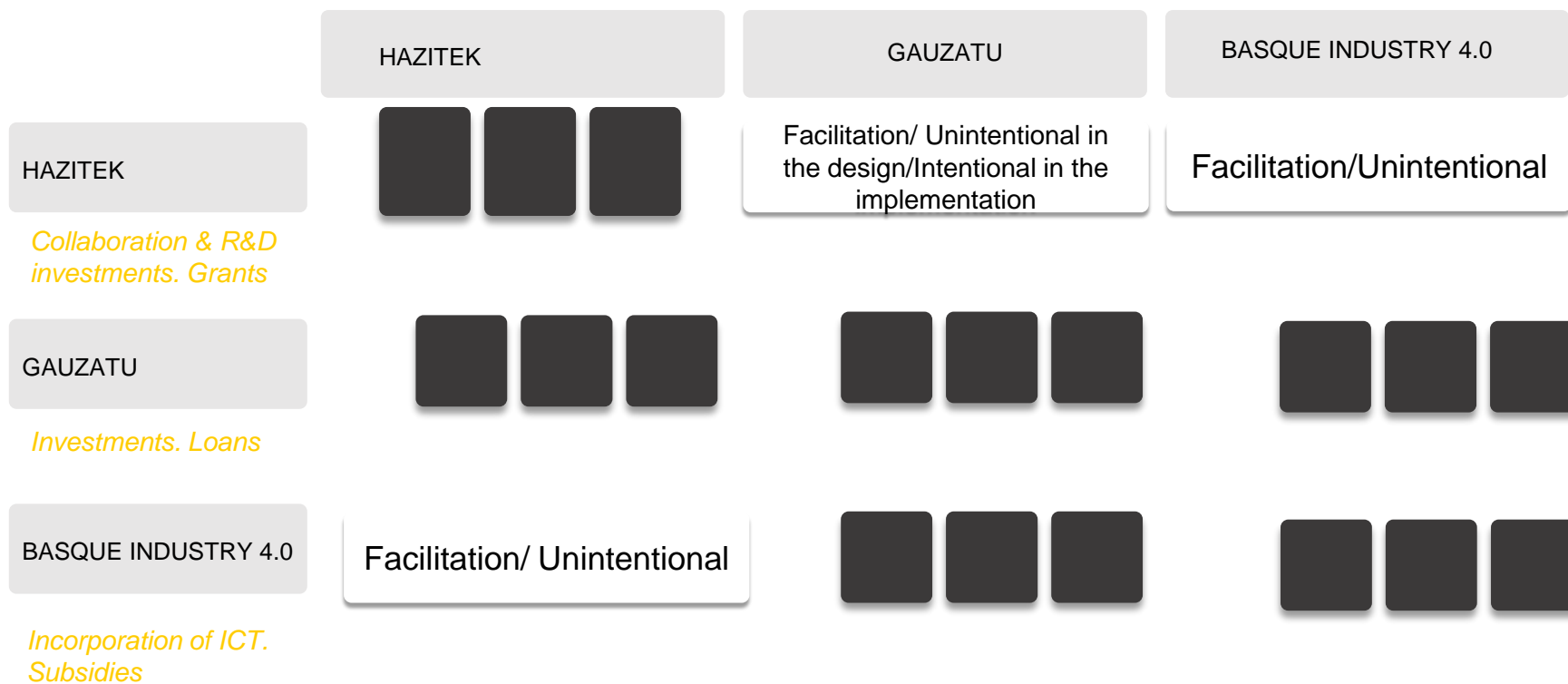
Basque Country

Some highlights about the specific instruments and the innovation policy-mix for Advanced Manufacturing

- Large portfolio of instruments from different levels
- Business-oriented policy-mix but also emphasis on R&D collaboration
- Predominance of direct instruments (e.g. grants for R&D projects) and economic instruments (complementarity with other policies (i.e. cluster policies))
- Some instruments implemented through Ministerial Agreements (multi-level approach)
- Instruments directed to Advanced Manufacturing also at sub-regional level
- Strong focus on direct measures (grants and loans) targeting firms (mainly SMEs)
- Instruments have different and complementary objectives, covering a whole range of TRLs from TRL 1 to TRL 7)

Basque Country

Policy Mix description



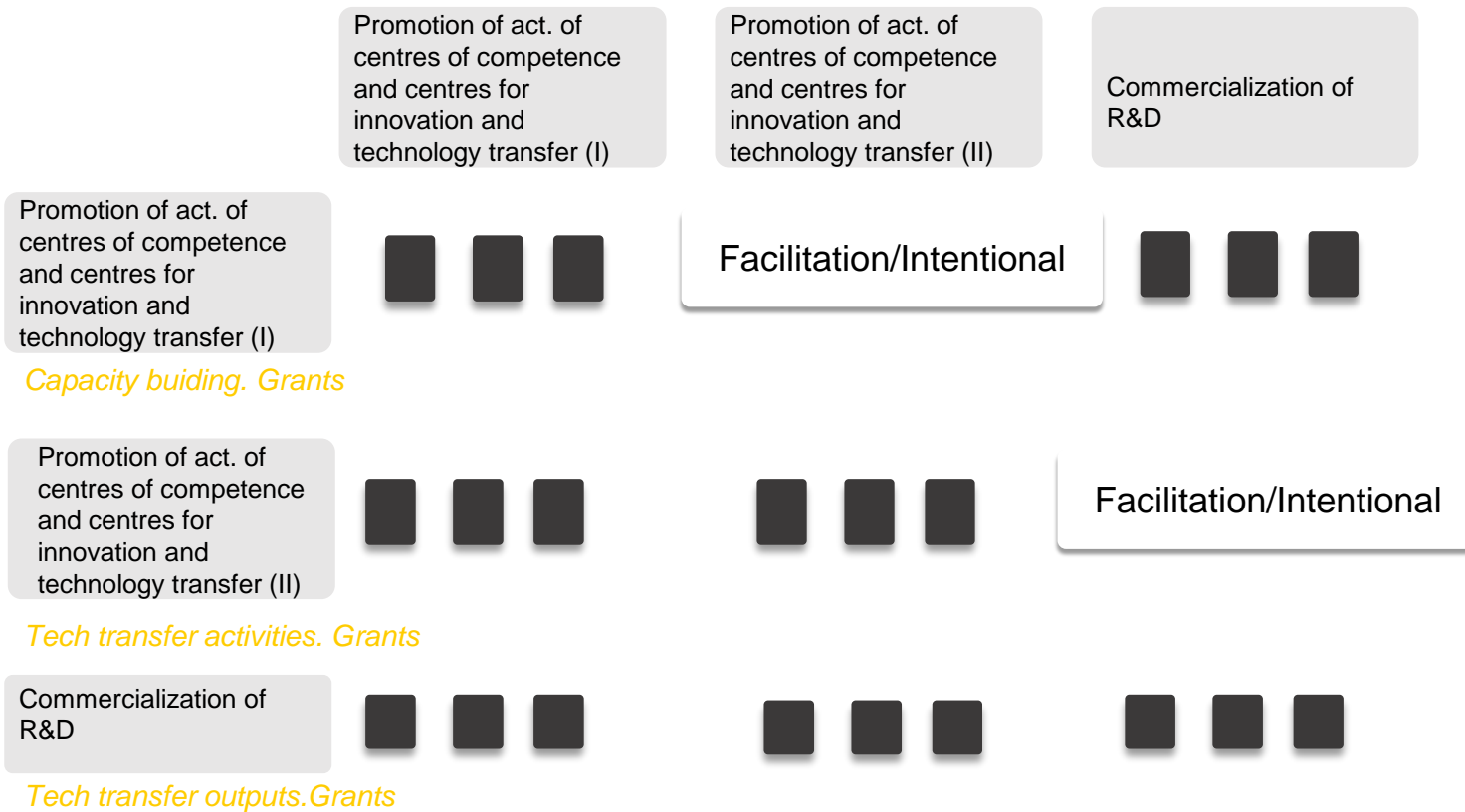
Lithuania

Some highlights about the specific instruments and the innovation policy-mix for Advanced Manufacturing

- Research institutes and universities oriented policy-mix (also firms are beneficiaries)
- Predominance of direct instruments (i.e. grants)
- Horizontal instruments but advanced manufacturing is one of the selecting criteria.
- Strong focus on direct measures targeting research organisations
- Instruments have different and complementary objectives and try to cover high TRLs (commercialisation of R&D)
- High dependence of EU funding

Lithuania

Policy Mix description

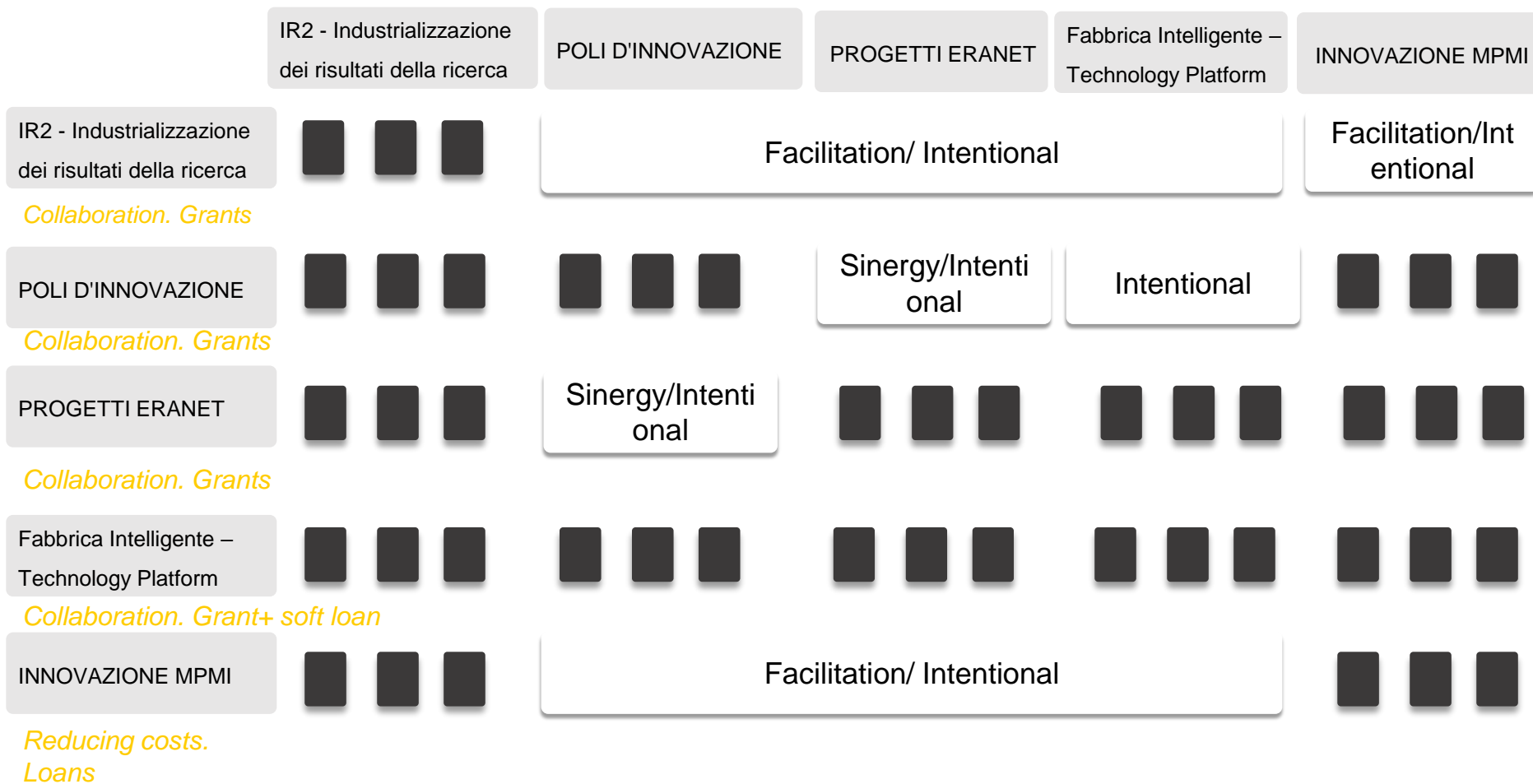


Some highlights about the specific instruments and the innovation policy-mix for Advanced Manufacturing

- Business-oriented policy-mix
- Predominance of direct instruments (e.g. grants for collaborative R&D projects) and linkage instruments.
- Some instruments implemented through Ministerial Agreements (multi-level approach)
- Combination of horizontal instruments specially aimed at the R&D collaboration domain with instruments specially aimed to Advanced Manufacturing
- Strong focus on direct measures (grants and loans) targeting firms (mainly SMEs, but also big companies)
- Instruments have different and complementary objectives, their rationale is to establish a policy mix supporting the whole process, from R&D to industrial investment. But the TRLs that cover the four first programmes are the same (from TRL 4 to TRL 7)

Piedmont

Policy Mix description

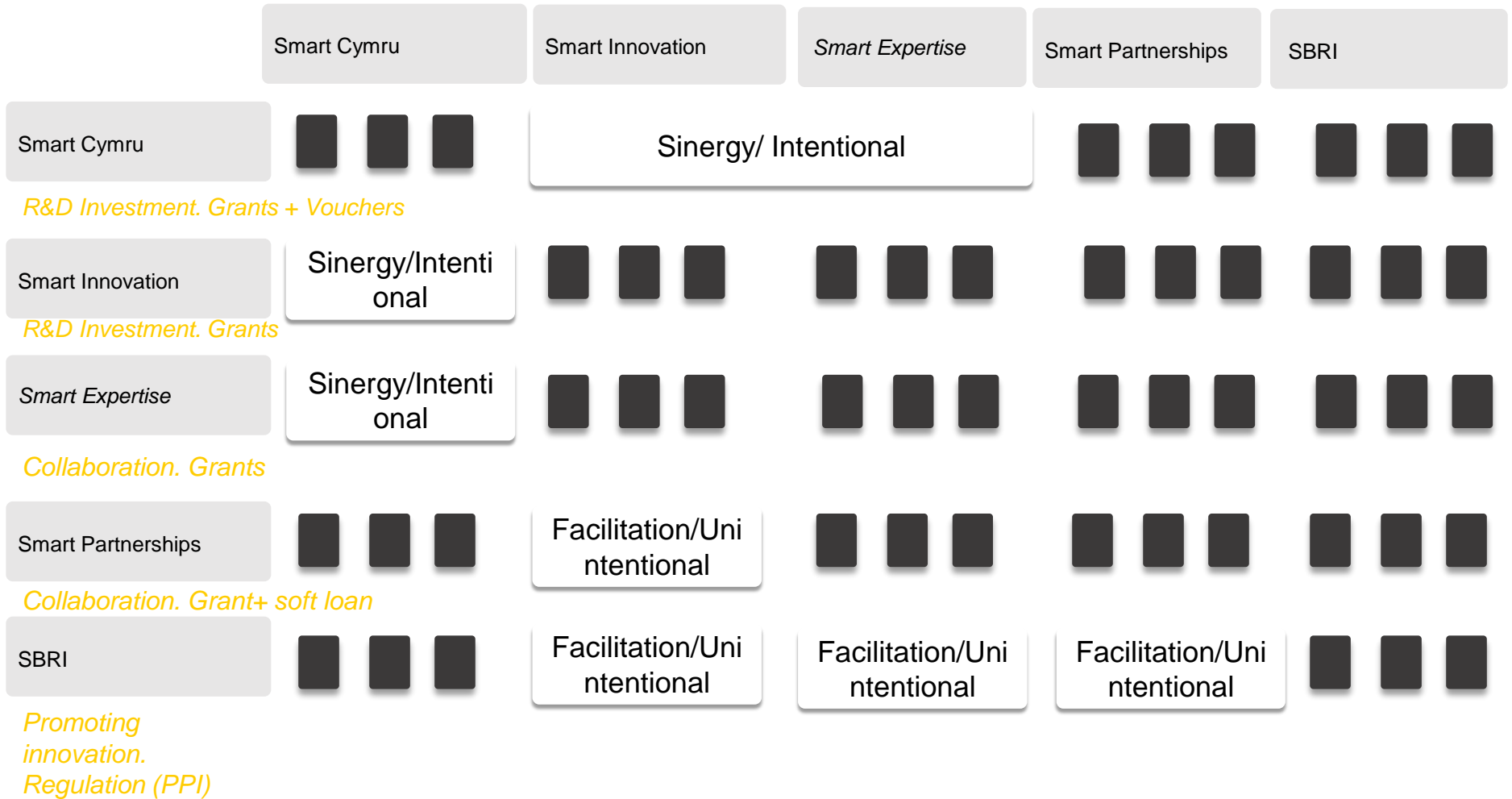


Some highlights about the specific instruments and the innovation policy-mix for Advanced Manufacturing

- Business-oriented policy-mix
- Predominance of direct instruments (e.g. grants for collaborative R&D projects) and economic instruments (except PPI)
- High dependence of EU funded and some links with national instruments (PPI-SBFI)
- Combination of horizontal instruments although AM is a priority area that is prioritised
- Strong focus on direct measures (grants and loans) targeting firms (mainly SMEs, but also big companies)
- Instruments have different and complementary objectives and cover from R&D to commercialisation activities

Wales

Policy Mix description



CONCLUSIONS

Conclusions

- Different contexts and approaches to advanced manufacturing lead to different policy-mixes
- Instruments implemented in a region/country are dependent on many factors, such as the industrial structure, the dependence of EU funding, the devolved competences (verticality of instruments) and the instruments historical roots (path dependency)
- Directionality has been included in all regions as a feature in policy instruments (with d
- Regional policy-mixes have a strong focus on economic instruments but also includes *soft* (linkage) ones
- Innovation policy-mixes are often designed in a intentional manner and facilitation tends to be the most usual target effect but it is also perceived unintentional effects.
- However, there is a need of evaluating policy-mixes so this facilitation/complementarity or even synergy can be captured for policy learning purposes.



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Thank you!

Questions welcome



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