

PLAN



Action Plan 2010-2013

Executive Summary

OCTOBER 2009



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PROLOGUE

Readers of this Action Plan are likely to be familiar with the history of the Junta para la Ampliación de Estudios e Investigaciones Científicas (Board for Advanced Studies and Scientific Research, JAE) and the CSIC, starting with the former's creation in 1907 and its subsequent transformation into the CSIC, and the latter's current configuration as a State Agency



Things have changed so much since the early 20th century, when the first efforts to institutionalise teaching and science in Spain began, that one could almost say we are in a completely different country. Thus, to get an idea of where we are now, at the start of the 21st century, the second chapter of this monograph takes a look at the CSIC today. This information is complemented with that given in chapter three, which also takes a fairly detailed look at the level reached by other equivalent institutions to ours in other countries, from which we will need to continue to gradually incorporate a number of good practices. The fourth chapter reports on how we have performed the tasks we had set ourselves in the previous Action Plan, four years ago. The following chapters give an account of the process followed during the preparation of this Action Plan for 2010-2013, the targets to be met, the progress indicators, and the strategy to be developed and human and financial resources necessary to achieve them.

We have already come a long way, but will need to continue advancing along the lines set out in the Action Plans, until we take our place among the elite of world science.

The first year in which this new Plan is in effect will coincide with the Spanish presidency of the European Union, which will be responsible for implementing some of the policies designed in the 2000 Lisbon Agenda. It is also taking place at a time of serious economic crisis, which is having negative consequences for R&D funding in the private sector as well as in public institutions: according to our data, cutbacks have also taken place in business R&D, despite its already being fairly thin on the ground in Spain compared with leading countries in Europe, Asia, America or so-called emerging countries.

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The budgetary increases that accompanied the previous plan from 2006-2009 have therefore given way to a much more limited panorama, which will oblige us to reschedule and redefine some of our goals.

However, we hope that we have now reached the peak of the economic crisis and in subsequent years we can recover the pace of the previous stage

A pluri-annual action plan, even when it relates to an organisation like the CSIC, is not a scientific text, but a policy one, in this case dealing with science policy. This means that the plan in question needs to define strategies, establish priorities, assign the available resources and set targets. Plans are an instrument or tool the institution uses to set its programme and facilitate the best execution of its functions. However, in order for it to serve its ends, it needs to be based on the scientific activity carried out in the organisation. Thus, this volume is complemented by the Strategic Plans of all the centres and institutes, the Scientific/Technical Areas and the Horizontal Units, including support and management units, and the scientific infrastructure managed by the CSIC. Chapter five describes the exhaustive process followed. In short, it gives an account of the collective effort by all the CSIC's personnel, who it is only fair to thank and for their dedication and the effort they have made in order to make the plan presented here a reality.

The functioning of the CSIC State Agency should be based on fulfilment of objectives in the context of strategic planning. It therefore needs the design of strategies, procedures and decision-making to permit us to have the ability to adapt to the changing conditions of the world of research, in order to promote our international presence, gain visibility and remain competitive in the new challenges of research.

In this context, the Action Plan gives a strategic vision of the research activity of the institution over the next four years. Moreover, it will be a benchmark for decision-making regarding the assignment of resources and the general decisions affecting research centres and institutes, and above all, the support and management units, and the scientific and technical facilities for which we have national or international responsibility. Finally, this Plan constitutes the basis for the Management Contract with National Government in the context of the CSIC's new legal status as a State Agency.

However, this Action Plan we are presenting here now, despite its numerous

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new features, is a link in a long chain which began in the nineteen eighties. The experience accumulated has also served as a model for other institutions, in particular the National R&D Plan implemented by Law 13/86 of 14 April 1986, the so-called "Science Act."

We are therefore far from being novices in the business of programming our activity, although we are aware that it is an exercise which, like scientific research, does not have predefined frontiers.

Madrid, 15 October 2009.

Rafael Rodrigo
President of the CSIC



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With the CSIC's conversion from being an autonomous body into a State Agency at the end of 2007 and the entry into force of its statute, it became necessary to draw up a multi-annual Management Contract every four years in which the Agency's activity would be planned and the objectives for the period set (subject to annual monitoring), and to assign the resources necessary to achieve these goals. The CSIC's Action Plan for the period 2010-2013 is the initial document on which this management contract will be based. The Action Plan analyses the CSIC's situation going forward over the period considered and prepares a strategy aimed at fulfilling the objectives of the CSIC's mission.

According to its Statute, the management contract should be approved by the agency's governing board in the first quarter of the year prior to its coming into force. This defines a timeframe for the preparation of the action plan, as it is a complex process affecting the whole institution in a top-down way, and is necessary in order to have an accurate and up-to-date perspective of the previous activity of the CSIC, its real capabilities and forecasts for the evolution of research, management and support needs, etc. as seen by the CSIC's real protagonists, who are none other than its researchers and support and management staff.

This executive summary describes, in abbreviated form, the process, the strategy designed, the necessary resources, and the objectives proposed in the progress indicators.

The 2010-13 Action Plan

The CSIC's Action Plan for 2010-13 follows the same basic philosophy as its predecessor, which ran from 2006-2009, in that it is oriented towards the achievement of goals and includes an evaluation phase for the centre/institutes' strategies carried out by panels of international experts. However, the 2010-2013 Action Plan, far from being a simple re-publication of the previous plan, entails a totally new exercise with unique characteristics and a new strategy, objectives and indicators. As in the previous instance, the 2010-2013 Action Plan includes the strategic plans of the centres and institutes in a standard common format. This was a new design that was implemented on the web for fully online use. The horizontal units have also drawn up their strategic plans in a specific format, which differs from that designed for the centres and institutes. In this planning exercise all the CSIC's functional units have drawn up their own strategic plan.

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It can therefore be said that the 2010-2013 Action Plan is a comprehensive plan for the whole institution.

The main characteristics of the 2010-2013 Action Plan are summarised in the table below:

Includes all the CSIC's units, including those that are strictly management related
Has a bi-directional focus: <i>down→top & top→down</i>
Based on planning by objectives
All the functional units have prepared a Strategic plan
International external evaluation
Backs a focus on actions in Strategic axes
Takes the quality of scientific output into account
Introduces internationalisation as a dimension of strategic planning
Includes outreach as a specific objective
Takes into account the Research lines pursued by the centres/institutes
Prepared entirely online

The results of this process are subdivided into four parts

The CSIC's institutional strategic plan
The Strategic Plans of the Scientific/technical Areas
The Strategic Plans of all the centres and institutes
The Strategic Plans of the Horizontal Units

Preparation began in June 2008 and was organised in two phases. In the first, the largest and most complex, the strategic plans of the centres and institutes and the horizontal units were prepared. This phase took place over a total period of nine months. The second phase was completely horizontal and referred to the CSIC as a whole. In this second phase, the output of which is this document, a strategic plan was drawn up for the institution, identifying the objectives to fulfil and designing the strategy with which to achieve them during the period 2010-13 of the action plan's execution.

Centre and institute and Horizontal unit Strategic Plans

The general procedure for the preparation of the centres and institutes' strategic plans and those of the horizontal units is described in chapter 5 of this document. Broadly speaking, the process was as follows:

1. The institutes organised their strategic plans around their existing research lines and services.

2. The research lines (and, optionally, sublines) and Services prepared their respective strategic plans, such that the strategic plan for a centre/institute includes those of its component parts. However, it is more than merely the sum of them, as it involves critical assessments and a definition of the centre/institute's own strategy and global objectives. For the purposes of enabling the subsequent international evaluation of the strategic plans of the centres and institutes, all the documentation and the process as a whole were translated into English.

3. Once the strategic plans had been prepared they were subjected to an external evaluation by specific panels of external experts proposed by ANEP, the Spanish National Evaluation and Foresight Agency (Agencia Nacional de Evaluación y Prospectiva). The composition of these panels is described in chapter 10 of this document. These panels informed all of the strategic plans of the lines and services and the overall centre/institute strategic plan. The sub-lines were not individually evaluated as such, but in the context of the research line to which they belonged. The evaluation took place in two phases. The first was performed remotely, using the web application to query and evaluate the strategic plans of each institute and its component parts. The second phase took place on site and during this phase the commissions interviewed the directors of the centres and institutes and debated the details of their respective strategic plans with them.

4. Once their strategic plans had been evaluated, the directors of the institutes discussed the results of the evaluation with the CSIC's Area Commissions and possible amendments to the strategic plan for each institute proposed by the evaluation commissions. In this phase, the objectives put forward by the centre/institute were also negotiated, and the resources (human and financial) applied for and assigned in the 2010-13 Action Plan ("Equipa" strategic line, JAE programmes and tenured scientist posts for the period 2010-13).

This final phase completed the process of preparation of the centre and institute strategic plans.

The horizontal units, whether scientific or management and administration, also followed a similar process. Unlike the centres and institutes, the strategic plan and evaluation was conducted in Spanish, except in the case of horizontal units of a scientific nature (unique facilities, for example), where the process was virtually identical to that of the centres/institutes, except for the format of the strategic plan, which was adapted to the characteristics of a service unit.

CSIC Strategic Plan 2010-13

The CSIC's overall strategic plan within the framework of the 2010-13 Action Plan is set out in this document and constitutes the CSIC's strategy for the period

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2010-2013.

The strategic plans of the centres and institutes and the horizontal units were taken into account when preparing the strategic plan, together with the evaluations received and the generic reports the evaluation commissions made on the process as a whole. Additionally, a transversal analysis of the CSIC was conducted to ascertain its current situation, which is the starting point for execution of the 2010-2013 Action Plan.

Chapters 2 and 3 of this document briefly summarise the general structure of the CSIC and its current situation, for the purposes of strategic planning for 2010-2013. In order to prepare this, the degree of execution and objectives attained during the previous Action Plan (covering the period 2006-09) were taken into account, an analysis of which is included in chapter 4. Chapter 6 outlines what is expected of the CSIC in the context of the 2010-13 Action Plan and the purposes for which the CSIC State Agency was created. This chapter also discusses the possible indicators that might be used and sets target values for these indicators for each year from 2010 to 2013.

Objectives and indicators of the CSIC State Agency's 2010-13 Action Plan

The CSIC's 2010-13 Action Plan is oriented towards fulfilling the CSIC's objectives as defined in article 4 of its statute. These are:

- the advancement of knowledge**
- training personnel**
- economic, social and cultural development**
- expert advice**

A series of indicators have been defined in order to evaluate the level of fulfilment of these objectives. In the case of the first two objectives, direct indicators exist with which to determine the effectiveness of the measures and actions taken in the period of time considered. However, in the case of the last two objectives, there are no direct indicators allowing their degree of fulfilment to be measured objectively. Derivative indicators normally related to the activities referred to have therefore been selected.

The general objectives of the CSIC State Agency are the objectives defined in its mission statement. In order to fulfil them, this 2010-13 Action Plan has been defined and the strategy described in chapter 8 of this document has been designed. However, in turn, this strategy defines a series of strategic objectives that, if

they are achieved, will ensure the CSIC fulfils its mission and objectives. Progress towards objectives can be followed by means of a series of indicators which collectively give a good gauge of the level of fulfilment of CSIC State Agency's objectives and mission. The objectives and indicators are described in more detail in chapter 6. At the end of this executive summary the target values proposed for the progress indicators in each of the years the 2010-13 Action Plan is in force are shown.

The SWOT analysis

These strategic objectives are based on a SWOT analysis (strengths, weaknesses, opportunities and threats) of the CSIC with a view to its implementing its mission (chapter 7). This analysis, a classic in processes of strategy definition and planning, has highlighted the principal strengths of the institution and its worst weaknesses. According to this analysis the principal strength of the CSIC lies in its multi-disciplinarity, a feature which enables it to utilise the main opportunity offered by its environment: the need for trans-disciplinary research to seek out solutions to scientific, technical and societal problems. The institution's administrative and management difficulties were identified in the SWOT analysis as its most significant weaknesses.

OCRE: the CSIC's strategy for 2010-13

The OCRE (from the Spanish words for Organisation, Knowledge, Answers and Experts) strategy, which is described in chapter 8 of this document, is based on the SWOT analysis. This strategy aims to enable the CSIC to achieve the aims of its mission with maximum efficiency. OCRE is based on five strategic objectives: ***Transdisciplinarity, Focusing, Incentivisation, Efficiency and Openness***. The first two of these are interrelated and refer to the strategic planning of research. While the generic actions which underpin many of the CSIC's research capabilities are important, Focusing and Transdisciplinarity are oriented towards research focused on specific topics (the strategic axes of the 2010-13 Action Plan) in a transdisciplinary way that covers the whole spectrum, thereby leveraging the CSIC's principal strength, namely its multidisciplinaryity. However, as mentioned, OCRE does not ignore generic non-focused actions, as to do otherwise might jeopardise the multi-disciplinarity that is the characteristic of the CSIC and thus leave it vulnerable.

Incentivisation and Effectiveness are strategic objectives aimed at ensuring the CSIC performs its functions in an effective and efficient way: effective, in that it achieves its objectives, and efficient in that it does so with a constrained use of resources, which are limited in the current adverse economic climate.

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Finally, Openness is a strategic objective oriented to further integrate the CSIC with the R&D system and promote collaborative relationships, which are essential to the current progress of science and research, as well as forming part of the objectives of the CSIC's mission (expert advice, training).

Strategic lines of OCRE

The OCRE strategy is organised around four main poles: **Organisation, Knowledge, Answers and Experts**, the Spanish initials of which make up the name given to the strategy. Each pole includes several strategic lines.

Organización (organisation): this is aimed at ensuring the CSIC is able to perform its functions efficiently. The main lines of the Organisation pole are:

Procesos (processes): whose main function is to improve internal management processes

Relación (relationship): whose main objective is to facilitate institutional collaboration and the creation and membership of science/technology lobbies.

Cohesión (cohesion): aims to improve the internal image of the institution so as to achieve an optimal working environment generating involvement and commitment among CSIC personnel

DESPLACE: (move): designed to ensure the 2010-13 Action Plan is implemented correctly in accordance with the OCRE strategy and, where necessary, define corrective mechanisms to overcome contingencies that may arise preventing any of the actions from being carried out.

Conocimiento (knowledge): this pole has been defined so as to promote and bolster knowledge generation, and is therefore aimed directly at one of the specific objectives of the CSIC's mission as a State Agency. Moreover, Knowledge is key to opening up the way to other CSIC objectives. This pole includes the following strategic lines:

Focus: this line is the paradigm of the Focusing strategic objective. *Focus* centres on promoting, strengthening and facilitating research along five specific strategic axes which may possibly be expanded in the future. These strategic axes are oriented towards a wide range of problems. Initially, *focus* envisages the following strategic axes: *Energy, Global Change, Water Resources, Advanced instrumentation and Engineering, Aging and Quality of Life.*

Equipa (equip): strategic line oriented towards improving the competitiveness of the CSIC's centres and institutes through financial support for scientific infrastructure.

Vértices (vertices): their function is to rationalise the use of the CSIC's facili-

ties, by consolidating services and facilities that are common to several centres or institutes. This line also envisages the creation of new centres and institutes and the remodelling of existing ones.

Inicia (start): oriented towards new researchers joining the CSIC, to facilitate their initial integration and enable them to get down to work quickly.

Respuestas (answers): covers strategic actions aimed at transmitting knowledge to society and productive sectors: Knowledge Transfer. Respuestas has a direct impact on the fulfilment of the objective of the CSIC's mission to contribute to economic, social and cultural progress. This is sub-divided into two strategic lines which include several actions:

Lanzadera (shuttle): whose mission is technology transfer.

Difunde (disseminate): oriented towards disseminating knowledge to society.

Expertos (experts): this last pole centres on training personnel. It integrates two strategic lines:

JAE programmes: these include various experience-based personnel training programmes.

DoCiencia: also oriented towards training of personnel, but through teaching, by means of masters and specialisation courses.

Resources

Chapter 9 of this document summarises the budgetary and human resource requirements to deploy the strategic plan that has been prepared and implement the actions envisaged in it. With an ethical attitude and seeking to retrain costs as far as possible, modest resources are proposed, at a level considered to be the minimum necessary for the CSIC State Agency to achieve the goals set out in its mission statement.

The economic resources proposed envisage very modest inter-annual increments (2009-2010: %; 2010-2011: 5%; 2011-2012: 7.5%; 2012-2013: 10%), in line with the likely progress of the economy in the post-crisis period.

The proposed human resources emphasise training (with a total of 5,257 contracts for the whole 2010-13 period) and support and management personnel, whose current shortage and limitations constitute one of the institutions biggest weaknesses, according to the SWOT analysis.

The human and economic resources tables envisaged in the CSIC's Action Plan for 2010-13 are shown at the end of this executive summary.

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Target values of the CSIC 2010-13 Action Plan's progress indicators.

Target values for the effectiveness indicators

Effectiveness indicators	2010	2011	2012	2013	Cumulative 2010-13
Articles/papers	8.500	8.925	9.371	9.840	36.636
Papers – impact (Standard/1,000)	133,6	140,3	147,3	154,6	576,0
Complete books	390	410	423	451	1.674
Conferences	2.356	2.480	2.631	2.789	10.256
R&D Contracts (M€)	48	50	51	53	202
Patents (applications) ¹	225	250	275	300	1.050
Patents (licensed) ¹	56	63	69	75	263
Spin-offs ¹	4	5	4	5	18
Theses	651	683	701	718	2.753
Courses (credits x students)/1.000	1.250	1.266	1.282	1.325	5.123
Popularisation-events (number)	623	654	726	881	2.884
Popularisation-materials (number)	659	692	740	814	2.905
Ordinary budget² (M€)	619	625	657	706	2.607
External income (M€)	220	231	243	255	949

¹ The target values for patents and spin-offs depend on the creation of the CSIC-K2B holding company proposed in the OCRE strategy (page 177).

² In each case, the ordinary budget from the previous year is shown in order to calculate the efficiency values.

Target values for the efficiency indicators

Efficiency indicator	2010	2011	2012	2013	Cumulative 2010-13
Cost correction factor	1	1,05	1,10	1,16	-
Articles/papers	1.373	1.499	1.569	1.617	6.058
Papers – impact (Standard)	21,6	23,6	24,7	25,4	95,2
Complete books	63,0	68,9	70,8	74,1	276,8
Conferences	381	417	441	458	1.696
R&D Contracts (M€)	7,8	8,4	8,5	8,7	33,4
Patents (applications) ¹	36,3	42,0	46,0	49,3	173,7
Patents (licensed) ¹	9,0	10,6	11,6	12,3	43,5
Spin-offs ¹	0,6	0,8	0,7	0,8	3,0
Theses	105	115	117	118	455
Courses (credits x students)/1.000	202	213	215	218	847
Popularisation/events (number)	101	110	122	145	477
Popularisation-materials (number)	106	116	124	134	480
External income	35,5	38,8	40,7	41,9	156,9

¹ The target values for patents and spin-offs depend on the creation of the CSIC-K2B holding company proposed in the OCRE strategy (page 177).

Human Resources in the CSIC 2010-13 Action Plan

Forecast Human Resources for 2010-2013

	2010	2011	2012	2013	2010-13
Scientific Personnel					
Tenured scientists	130	150	175	200	655
Scientific researchers	10	12	15	20	57
Research professors	7	9	12	15	43
Scientific personnel subtotal	147	171	202	235	755
Trainee personnel – JAE programme					
JAE-Doc	250	260	286	315	1.111
JAE-Pre	250	260	286	315	1.111
JAE-Tec	350	365	400	440	1.555
JAE-Intro	350	350	350	350	1.400
JAE-Transfer	20	20	20	20	80
Subtotal JAE	1.220	1.255	1.342	1.440	5.257
Support personnel					
Specialist with higher qualifications	110	115	125	140	490
Technicians with mid-level qualifications	80	90	100	110	380
Research assistant	80	90	100	110	380
Support personnel subtotal	270	295	325	360	1.250
Management personnel					
General national govt manager	15	17	20	25	77
Nat. govt. IT systems manager	15	20	25	30	90
Nat. Govt. IT technician	20	25	30	35	110
Museum curator	3	3	4	5	15
Archaeological library archivist	3	3	4	5	15
Museum, library and archive assistant	5	5	5	5	20
Junior architect	3	3	2	2	10
Junior museum, library and archive assistant	5	5	5	5	20
Nat. govt. clerical assistant	50	60	70	70	250
Nat. govt. junior clerical assistant	120	125	135	145	525
IT and management subtotal	239	266	300	327	1.132
TOTAL	1.876	1.987	2.169	2.362	8.394

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Financial resources envisaged in the CSIC 2010-13 Action Plan

Budget of the CSIC State Agency 2010-2013 (k€)

	2009	2010	2011	2012	2013	Total 2010-13
Ordinary budget	619.276	625.468	656.742	705.998	776.597	2.764.805
External income	229.416	231.711	243.296	261.543	287.698	1.024.248
Total	848.692	857.179	900.038	967.541	1.064.295	3.789.053
Annual increment		1%	5%	7,5%	10%	

Strategic items

Infrastructure support	20.000	21.000	23.100	25.410	89.510
Scientific actions	20.000	21.000	23.100	25.410	89.510
Total actions	40.000	42.000	46.200	50.820	179.020

CONOCIMIENTO



Fundación General CSIC