Call for tenure track projects

'Computational sciences for energy research'

Guidelines for proposals

2015

A joint programme in the field of Chemistry (NWO-CW), Earth & Life Sciences (NWO-ALW), Physical Sciences (NWO-EW), Physics (FOM) and Technical Sciences (STW)

This common programme is implemented by the Physics Division of NWO, the Foundation for Fundamental Research on Matter (FOM)
1. Introduction

This document serves as a guide for applicants who want to submit a tenure track project proposal to the Shell-NWO/FOM programme 'Computational sciences for energy research' (CSER). The detailed format for proposals is given in section 3.

1.1. Context

In 2012, Shell, the Netherlands Science Foundation (NWO) and Foundation for Fundamental Research on Matter (FOM) started a joint large-scale public-private partnership in fundamental research in the energy domain. Shell will invest circa 20 million euro in cash, an investment which will be used to fund 75 PhD positions at Dutch universities. NWO's investment will amount circa 21 million euro, creating a total budget for the programme of 41-50 million euro, depending on the participation of other companies and special governmental support, the so-called 'TKI-toeslag'. Whereas the Shell-NWO/FOM alliance is central to this initiative, other companies are explicitly invited to join and to invest in the collaboration.

The majority of Shell's investment comprises the CSER PhD programme. It has a volume of 60 PhD research projects in total, which will be allocated in a series of calls in the period 2012-2016. This programme will cover themes within the top sectors Energy and Chemistry. The remainder of Shell's investment will contribute to the NWO-theme 'Duurzame Energie' through the programmes 'Uncertainty reduction in smart energy systems' and 'CO2-neutral fuels'. For these programmes separate calls have been organised. Besides NWO's investment in these programmes, NWO's participation includes an investment of circa 7 million euro in the Dutch knowledge infrastructure, mostly through two calls for a total of 8 new tenure track positions to make a sustainable contribution to the computational sciences in the Netherlands.

Various NWO divisions are involved in the CSER initiative: FOM, Physical Sciences, Chemical Sciences, Social Sciences, Earth and Life Sciences, and Technology Foundation STW. This collaboration across a range of computational science disciplines is uniquely positioned to give a long-term boost to the field of CSER. The combined Shell-NWO/FOM initiative will also lead to a further strengthening of the relation between Dutch and Indian research communities. An important driver for Shell to invest in this initiative is to use the programme as a recruitment pool for computational scientists for its technology centre in Bangalore, India.

1.2. The present call

The current call for tenure track projects is part of the joint programme to make a sustainable investment in the computational sciences in the Netherlands in the field of Chemistry (NWO-CW), Earth and Life Sciences (NWO-ALW), Physical Sciences (NWO-EW), Physics (FOM) and Technical Sciences (STW) for which a total budget of M€ 6.7 is available. The present, second call with a budget of M€ 4.2 is for a maximum of 6 new tenure track projects in the field of computational sciences, relevant to the energy-related themes within the top sectors Energy and Chemistry. The call is open for all areas, like computational chemistry and materials science, multiphysics, big data, computational geoscience, etc.
1.3. Computational science

As a working definition for computational science we refer to Sameh et al.\(^1\), who described this area of research as: 'Computational science seeks to advance science and engineering disciplines through better understanding of advanced computers and computational models, as well as advancing the state of the art in computer architecture, system software, and algorithm design through better understanding of science and engineering applications.' Important features of computational science are e.g. the interplay between pure science and applications thereof and between theory, experiment and simulation. Computational science, according to Sloot\(^2\), brings together application, algorithm and architecture into a problem solving environment. It includes the use of statistical methods and stochastic optimization.

1.4. Top sectors

Applications have to contribute to one or more of the energy-related themes within the top sectors Energy ('Gas', 'Bio-energie', 'Wind-op-zee', 'Smart grids', 'Zonne-energie', 'Energiebesparing Gebouwde Omgeving', and 'Energiebesparing in de Industrie') and Chemistry ('Nieuwe Chemische Innovaties' and 'Smart polymeric materials' and 'Procestechologie'). Information with regard to these themes can be found in the innovation contracts, accessible through the hyperlinks above.

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2. Guidelines for applicants

2.1. Who can apply?
Proposals can be submitted by applicants with or without permanent employment from the Netherlands or abroad and should be written by researchers that apply for a new tenure track position. The successful applicants will be employed at a Dutch university or Dutch research organisation (such as the NWO institutes) that, at least in part, are funded by the Ministry of Education, Culture and Science, as defined in the 'Regeling Subsidieverlening NWO' to be found at [www.nwo.nl](http://www.nwo.nl). For each of the calls, an applicant may submit a single proposal only. As the goal of the programme is to provide a sustainable investment in the field of computational sciences relevant to the energy-related themes a long-term commitment of both the applicant and the host organisation is expected. A successful tenure track should therefore lead to an assistant professorship (UD). As an ambition, the candidate should grow to become a full professor in the near future.

2.2. What can be applied for?
The following standard items are included in all projects:
- Personnel budget for the applicant, covering a maximum of 5 years actual gross salary and associated cost as specified in the current Dutch agreement on the funding of academic research ('Akkoord bekostiging wetenschappelijk onderzoek'), with the exception of indexation and end-of-project payments. The amount of these payments for this call will be based on the standard percentages on 1 July 2014, available [here](#).
- Additional personnel: 1 PhD position, total cost k€ 216. The PhD candidate will be formally employed by FOM, be recruited and selected by the applicant, be stationed with the applicant, and will have to be supervised by the applicant, who will also act as his/her co-promotor.
- Material budget: bench fee for consumer goods, travel expenses, publication cost for both the applicant and the PhD student. Infrastructure cost (accommodation and office automation) and other overheads are not eligible for funding.

The maximum budget for these standard items is k€ 700. The duration of a project is 5 years at a maximum. The PhD project falls within this period and lasts 4 years at a maximum.

If the applicant is to work no more than 25% of contracted working time on non-research activities (teaching/administration/management), the applicant's salary may be entirely charged to the project budget. If the applicant is to spend more than 25% of contracted working time to such activities, only that proportion of working time devoted to research may be charged to the project.

The proposed budget will be assessed by FOM. If it exceeds the maximum amount of grant available, the application must be accompanied by a letter from the prospective host organisations or a third party guaranteeing to cover the excess cost. This guarantee must be signed by the dean/manager of the organisation or by a person with authority to sign on behalf of the body issuing the guarantee.

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3 This call aims to fund new tenure track positions. Therefore, researchers that are currently permanently employed or are in a tenure track position may only apply if they intend to use this opportunity to start at a new position at a different organisation. Funding of (tenure track) positions started before 1 April 2016 is explicitly excluded.
2.3. Specific conditions

The applicant is free to choose an approved host organisation (see 2.1) at which to conduct the research. The quality of the applicant’s plans for achieving integration within the host organisation will be a criterion during the selection process. The appointment at the host organisation, and arrangements for integration within it, must be completed before any grant payment is made by FOM.

The applicant must submit a written agreement with the board of the organisation concerned. This agreement includes a description of the future conditions which the organisation will offer both the line of research and the candidate, after the 5-year granting period. In addition, the agreement describes the evaluation criteria to decide whether the candidate’s position will be made tenure after 5 years of tenure track appointment. During this evaluation 2 members of the CSER programme committee will act as external advisors to the evaluation committee.

Intellectual property rights to the knowledge generated by the planned research will rest jointly with the host organisation (for the share of the PI) and FOM (for the share of the PhD student).

2.4. When and how can be applied?

The deadline for proposal submission is **Monday September 14, 2015 at 17:00 hrs**. The proposal has to be submitted electronically through Flamingo in pdf-format using the format as described below in section 3 of this document. Flamingo can be accessed [here](#).

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*Suggestions for successful and consistent Tenure Track policy and practice in the Netherlands can be found [here](#).*
3. Format of the project proposal

The proposal has to be structured according to the format below, using exactly the same headings for the sections. The proposal should be written in English and should be no longer than 10 A4 pages (excluding appendices), with minimal fontsize 10.

1. Title of the project
Give a short and clear title.

2. Applicant
Give your name, title, and affiliation.
Give your full address, phone number and e-mail address.
Name the host organisation, including department and chair, if applicable.

3. Abstract
Give an outline of the proposed research in a few lines with a maximum of 150 words.

4. Keywords
Describe the field of research with a maximum of five keywords (such as for example computational chemistry, materials science, multiphysics, big data, computational geoscience, solar energy, fluid dynamics, etc.).

5. Key publications
List your five most important publications that are relevant to the field of research of the proposed research.

6. Scientific challenges, objectives and focus
Describe the scientific challenges of the proposed research. Give the main objectives and focus of your project. Also describe your personal mission in the field of research.

7. Relevance, background, and state of the art
The projects in this call on 'Computational sciences for energy research' should fall within the framework of the top sectors Energy and/or Chemistry (see to section 1.4 for more details). Therefore, describe to which one or more of the innovation contracts the proposed research relates to, what are the relevant background issues in this context, and what is the state of the art in this area of research.

8. Innovative character, progress beyond the state of the art, and application perspective
Describe the innovative character of the proposed research and how the proposed research will contribute to the advance of the particular field of research. Also describe the (long-term) application perspective of the expected results.

9. Methods, techniques and planning
Describe the methods and techniques to carry out the proposed research. Include the computational and data storage resources and requirements for this work. Provide a timeline of the proposed research.
10. PhD project
Describe how the PhD project, while challenging and independent on itself, is an integral part of the proposed research. The concise description should at least include a timeline, with a description of work per year, for this project.

11. Organisational integration and added value of new position
Describe both your and the host institute's plans for achieving organisational integration of this novel line of research that underlay the agreement referred to in section 4. Describe the added value of the proposed new position in computational sciences for the host institute and the Netherlands.

12. Budget
Give a summary of the budget requested within this proposal. For details and conditions see section 2.2. Make use of the following table:

<table>
<thead>
<tr>
<th>cost category</th>
<th>budget (k€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>personnel budget for the applicant</td>
<td>...</td>
</tr>
<tr>
<td>additional personnel (1 PhD student)</td>
<td>216</td>
</tr>
<tr>
<td>material budget (bench fee)</td>
<td>...</td>
</tr>
<tr>
<td>total</td>
<td>max. 700</td>
</tr>
</tbody>
</table>

13. References
Refer to articles that are relevant to the proposal. These may be (review) articles, books or other documents that may be useful to reviewers less familiar with the specific research area.

14. Appendices
List of documents that are submitted as appendices to the proposal (see also chapter 4).
1) Curriculum vitae of the applicant
2) List of publications of the applicant
3) Agreement with the board of the host organisation
4) Names and e-mail addresses of three persons who may be used to act as references
4. Obligatory appendices

The appendices do not count against the maximum of 10 pages and should at least include:
1) A curriculum vitae of the applicant
2) A list of publications of the applicant
3) A written agreement with the board of the host organisation concerned. This agreement includes a description of the future conditions which the organisation will offer both the line of research and the candidate, after the 5-year granting period. A successful tenure track should lead to an assistant professorship (UD). As an ambition, the candidate should grow to become a full professor in the near future. In addition, the agreement describes the evaluation criteria to decide whether the candidate's position will be made tenure after 5 years of tenure track appointment. During this evaluation 2 members of the CSER programme committee will act as external advisors to the evaluation committee.
   An example of such a declaration can be found at here.
4) Names and e-mail addresses of three persons who may be used to act as references

If applicable, in case the project budget exceeds the maximum amount of grant available, the application must be accompanied by a letter from the prospective host organisation or a third party guaranteeing to cover the excess cost. This guarantee must be signed by the dean or manager of the organisation or by a person with authority to sign on behalf of the body issuing the guarantee.

Reprints of publications and letters of recommendation (other than letters exclusively specifying financial or material commitments) will not be sent to referees and committee members and will not be taken into consideration when assessing applications. Therefore, please do not include these.

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5 Suggestions for successful and consistent Tenure Track policy and practice in the Netherlands can be found here.
5. Assessment procedure

5.1. Before submitting an application to FOM: selection by the host organisation
As a first step, before submitting an application to FOM, the candidates are expected to agree with their proposed host organisation on their candidature for a new tenure track position in the current call. This process might include a selection procedure at the host organisation, resulting in the obligatory aforementioned written agreement with the board of the host organisation concerned (see section 4).

5.2. Eligibility
FOM screens applications to ensure that they comply with the formal requirements of the scheme (see sections 2, 3 and 4). Only those which do so qualify for further consideration.

5.3. Selection by the Programme Committee and external referees
This part of the assessment procedure consists of the following steps:

1) All applications will be assessed and ranked by the Programme Committee which consists of experts in the field of computational sciences and/or in the field of energy research (see 5.5). This will result in a pre-selection of approximately 16 project proposals. Pre-selection takes place only if the number of applications received is at least five times the number of grants available. Otherwise, all the applications are sent to external referees without pre-selection.
2) The pre-selected proposals will be assessed by external referees. These will be independent and international experts from the relevant scientific and/or technological fields.
3) The applicants will be invited to submit a written response to the evaluation report of the external referees.
4) Based on the evaluation report and the response of the applicant, the Programme Committee will make a final ranking of the project proposals and invite a maximum of the 10 highest ranked applicants for an interview.
5) Based on the evaluation report, the response of the applicant, and the interviews, the Programme Committee will make a final ranking of the project proposals.
6) Based on this final ranking the Steering Committee and FOM Executive Board will award funding to a maximum of the 6 highest ranked applicants.

5.4. Selection criteria
During the selection by the Programme Committee and external referees the proposals will be evaluated on the basis of the following criteria:

1) Quality of the applicant
2) Scientific quality of the proposal
   - Are the objectives scientifically sound and challenging?
   - Is there sufficient scientific coherence in the project?
   - Is the applicant in a position to provide a significant contribution to the international expertise in this field?
   - Are the research methods effective and efficient?
   - Is the applicant sufficiently aware of existing research in the field?
3) Innovative aspects and application perspective
   - Are the scientific objectives innovative?
   - Are the computational methods proposed sufficiently challenging and/or innovative?
   - Is there a (long-term) application perspective for the results of the proposed research?

4) Relevance and urgency for the solution of the energy problem
   - Does the proposal fit in the aims and objectives of one or more of the roadmaps of the top sectors Energy and/or Chemistry?
   - Are the issue(s) addressed in the project proposal relevant to these aims and objectives?

5) Are the plans for institutional integration accurate? Is there a clear added value of the proposed new position in computational sciences for the host institute and the Netherlands?

The result of the evaluation of a project proposal will be a mark for each of these criteria. Also a general judgement will be given, which is not necessarily the average of these figures. The overall score forms the basis for the priority listing of all project proposals by the Programme Committee.

5.5. Programme Committee

In the Programme Committee a wide variety of expertise and disciplines is represented such as chemistry, physics, informatics, mathematics and several engineering disciplines. The Programme Committee consists of:

- Prof.dr.ir. B. (Barry) Koren (chair, TU/e)
- Prof.dr.ir.drs. H. (Hester) Bijl (TUD)
- Prof.dr. P.G. (Peter) Bolhuis (UvA)
- Prof.dr. J.F.J. (Jo) van den Brand (VU / Nikhef)
- Prof.dr.ir. M. (Marjolein) Dijkstra (UU)
- Dr. V. (Vianney) Koelman (Shell)
- Dr. L. (Lourens) Post (Shell)
- Prof.dr. L.R.B. (Lambert) Schomaker (RUG)
- Prof.dr. F. (Federico) Toschi (TU/e)
- Prof.dr. J.A. (Jeannot) Trampert (UU)
- Prof.dr.ir. J.J.W. (Jaap) van der Vegt (vice-chair, UT)
- Prof.dr. J. (Jakob) de Vlieg (Bayer CropScience NV)
- Prof.dr.ir. T.J.H. (Thijs) Vlugt (TUD)
- Dr. W. (Wim) Walk (Shell)
- Dr. M. (Martijn) de Jager (secretary, FOM)
- Dr. T. (Teun) Graafland (observer, Shell)
- Dr. P.A.J. (Pieter) de Witte (observer, FOM)
6. **Indicative time schedule and further information**

6.1. **Indicative time schedule**

For this call the following indicative time schedule applies:

<table>
<thead>
<tr>
<th>Date Range</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 March 2015</td>
<td>call publication</td>
</tr>
<tr>
<td>14 September 2015</td>
<td>call deadline at 17:00 hrs.</td>
</tr>
<tr>
<td>September / October 2015</td>
<td>pre-selection by Programme Committee</td>
</tr>
<tr>
<td>November / December 2015</td>
<td>evaluation by external referees</td>
</tr>
<tr>
<td>December 2015</td>
<td>written response to evaluation report</td>
</tr>
<tr>
<td>January 2016</td>
<td>selection by Programme Committee</td>
</tr>
<tr>
<td>February 2016</td>
<td>Programme Committee interviews with candidates</td>
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<tr>
<td></td>
<td>ranking by Programme Committee</td>
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<tr>
<td></td>
<td>decision by Steering Committee</td>
</tr>
<tr>
<td>March 2016</td>
<td>granting research projects by FOM Executive Board</td>
</tr>
</tbody>
</table>

6.2. **Further information**

For further information, please contact Dr. Martijn de Jager (martijn.de.jager@fom.nl or +31 (0)30 600 12 73). More information on the programme can also be found at [www.fom.nl/cser](http://www.fom.nl/cser).