



WELKOM
IN
MOL

ATOOMSTAD
NIJVERHEID
TOERISME

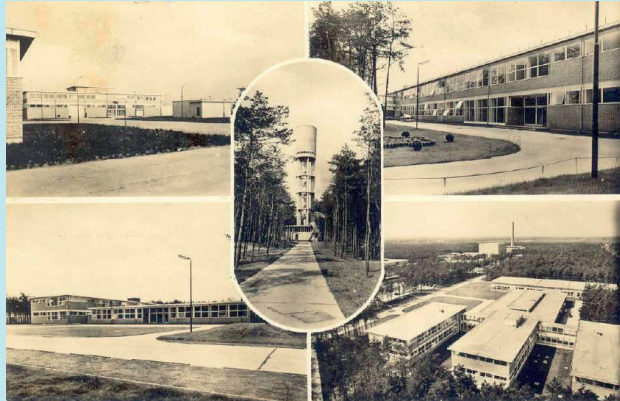
INTRODUCTION

On Friday 11 May 1956, at around half past six in the early evening, the first Belgian nuclear reactor BR1 (Belgian Reactor I) became operational at the nuclear site of the Nuclear Research Centre in Mol. Since the early morning, technicians had been working to insert uranium rods into the core of the reactor. A team of scientists closely monitored the neutron production in the reactor. The neutron flow was stopped several times, by placing graphite rods between the fissile material. Finally, with a total of 709 uranium rods, the amount of neutrons in the reactor began to increase exponentially, an indication that the critical fuel mass had been reached and that the intended chain reaction was underway. Under careful control, the reactor produced neutrons for three hours. Around ten o'clock in the evening, the reactor was shut down.

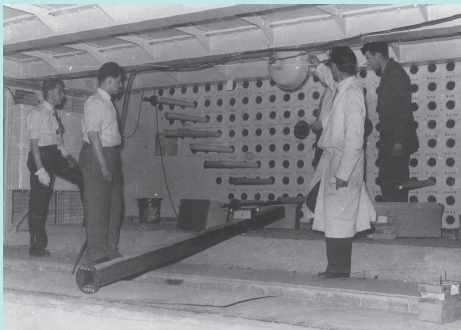
The start-up of the reactor was a crucial milestone in the development of the Belgian nuclear programme, which was set up in the years following the Second World War. As a producer of uranium in its Congolese mines, Belgium had the ambition to play a leading role in the scientific and industrial development of nuclear energy. With the BR1, Belgium immediately earned its place among the foremost nuclear powers. In Europe, Great Britain had of course taken a sizeable lead, but in comparison with other Western European countries, Belgium was only behind France, Norway and Sweden.

The BR1 was only a research reactor, but Belgian ambitions went much further. In 1957, Louis De Heem, Director-General of the Belgian Nuclear Research Centre in Mol, announced that Belgium would build no fewer than four nuclear power stations in the next ten years, which together would be able to meet 15% of the national energy demand. And that was just the start. Belgian industry aimed at developing unique nuclear expertise that could give it a competitive position on the European market. Things looked promising in the late 1950s. Maurice Masoin, President of the Nuclear Foundation, proclaimed in 1961 that Belgium was the most advanced country in the peaceful exploitation of nuclear research, after the United States, the United Kingdom, the Soviet Union and France.¹ The slogan “Belgium, the fifth nuclear power in the world” was eagerly adopted by the press and used in the official propaganda of the Belgian government.

¹ M. Masoin, “Énergie nucléaire”, *Revue M. Société belge des mécaniciens* 7 (1961) 4, 129-133.



In 1952, the Belgian government set up the Research Centre for the Applications of Nuclear Energy. Architects Jacques Wybauw and Jacques Thiran designed a modernist technical campus combined with a residential area for employees and students. The construction work started in 1954. Other community buildings were also built, including a school, clubhouse, sports complex, cafeteria, etc. The inhabitants of Mol soon referred to it as 'the Atom' or 'the Atom Village' (photo left Weekblad De Post [AM]). Later on, it was even possible to send postcards from the atomic village (photo right [DEL]). SCK CEN put Mol on the world map.



Start-up of the reactor on 11 May 1956 [DB]. The photo on the right shows the close monitoring in the BR1 control room [DB].

That Belgium had been able to get a foothold in this position was not a simple matter of course. It had required huge investments, difficult negotiations and concerted action by a wide range of players. However, there were also critical voices. The nuclear programme cost a lot of money. Would it not have been better spent on the ailing coalmines? Was the role that Belgium saw for itself as a nuclear power realistic? Could a small country like Belgium afford such a huge financial commitment? By the mid-1960s, it became obvious that these misgivings were not entirely unfounded. In a tense European climate where national interests often prevailed over mutual cooperation, it was not easy for Belgium to hold its own among the superpowers. Much of Belgium's lead in nuclear technology was quickly obsolete, and with Congo's independence Belgium lost its privileged position as a uranium producer. As the nuclear research approached the commercial phase, Belgian industry proved unable to compete with the large foreign groups. Of the original objectives laid down in the 1950s, very little had been achieved by the mid-1960s.

A fine-tuning of the original ambitions was inevitable. Theo Lefèvre, Minister of Science Policy and Programming in 1968, was not in the habit of painting things rosier than they appeared to him. "Would we have invested so much of our national science policy budget in the nuclear sector if we had known ten or twelve years ago that exports of power plants and fuels would be out of reach for companies the size of ours?" According to Lefèvre, what the Belgian research policy on nuclear technology had delivered had not matched expectations. The decisions taken in the 1950s had yielded very little, no more than "a small number of industrial applications." Worse still, Lefèvre also saw the future as bleak. "There are also no medium-term prospects on the horizon, of broad sales opportunities, as is the case for major technological orientations." Lefèvre believed that the pursued policy had failed. If we had known then what we know now, he concluded, "we probably would have made a different decision."²

Lefèvre was not the only one with misgivings about the appropriateness of Belgian investments in nuclear research. Critical opinions regularly appeared in the press. The financial burden of the Belgian nuclear programme was also an annual bugbear in the Chamber. In 1967, the Socialist member of parliament Jozef Cools, referring to Belgium's negotiations with Euratom, observed, "When one considers all of this, it is regrettable, Minister, that Belgium did not follow a different political line in 1959, as it can all be traced back to that."³ Moreover, it was not only the opposition that called into question the political direction of the nuclear programme. An independent

² Th. Lefèvre, *Het wetenschapsbeleid in België. Een nieuwe aanpak*. CEPES Bladen (1968), p. 20.

³ Chamber of Representatives. *Parliamentary Proceedings* (Session of 7 February 1967), p. 5.

study of the European nuclear landscape concluded in 1967 that Belgium's ambitions had been partly realised. Without European support, Belgium would have had to throw in the towel a long time ago.⁴ In 1971, the annual report of the Belgian Atomic Energy Commission noted that "the size and cost of the SNR300 programme at Kalkar [at that time the spearhead of Belgian policy] is too high for Belgium, but it is impossible to step back."⁵

The nuclear energy development program was not without controversy, nevertheless it represented a unique experiment in the history of Belgian science. Through intense cooperation between government, industry and scientific institutions, Belgium put itself on the international map as a nuclear power. Pivotal to the network of institutions and partners was the Belgian Nuclear Research Centre – Centre d'étude de l'Énergie nucléaire (SCK CEN). Set up in 1952, the Centre was used to support Belgian industry in developing its own nuclear sector, but also to strengthen Belgium's diplomatic negotiating hand on the European stage. As such, scientific prestige, industrial gain and the national interest set the agenda of the Centre for a long time. In the 1980s SCK CEN found itself in choppy waters. The Chernobyl nuclear disaster, the economic crisis, the reform of state and the fallout of a bribery scandal weighed heavily on the operations of the Centre. Yet out of the crisis emerged a new vision of the possibilities of nuclear applications. SCK CEN emerged as a modern scientific institute at the pinnacle of nuclear research both nationally and internationally.

The Research Centre will reach its 70th year in 2022, the ideal moment to finally put its long history down on paper. 'Finally', because until now this history has never been fully written. In 1994, Jacques Planquart published an overview of the Centre's first 40 years, and this was followed in 2007 by a more technical presentation by Pierre D'hondt, covering the period 1990-2015.⁶ On the occasion of its 50th anniversary, SCK CEN published a richly illustrated historical brochure, with contributions from a multitude of SCK CEN employees.⁷ However, in general publications on the history of Belgian science, only the founding history of SCK CEN is covered.⁸ These are slim pickings for a Centre that throughout its existence has occupied and continues to occupy a prominent place in the Belgian scientific community.

⁴ L. Scheinman, "Euratom: Nuclear Integration in Europe," *International Conciliation* 36 (1967), 1-67, p. 32.

⁵ Cited in I. Vanpol, "De besluitvorming inzake kernenergie in het Belgisch politiek bestel," *Res Publica. Politiek Jaarboek* 1981, 24 (1982) 327-348, p. 333.

⁶ J. Planquart, "Histoire du Centre d'Etude de l'Energie Nucléaire – CEN/SCK," in *Un demi-siècle de nucléaire en Belgique – Témoignages* (Brussels, 1994), 201-297; P. D'hondt, "SCK-CEN. Évolution 1990-2005," in M. Maris et al. (ed.), *Histoire du nucléaire en Belgique, 1990-2005* (Brussels, 2007) 99-135.

⁷ L. Verwimp and A. Verledens, *SCK CEN 1952-2002* (Mol, 2002).

⁸ P. Marage, "De kernfysica en de deeltjesfysica," in R. Halleux et al. (ed.), *Geschiedenis van de wetenschappen in België 1815-2000* (Brussels, 2001) 85-108.

Writing history means representing the chain of successive events, but also providing insight into the extent to which reality constantly changes in the process. This book attempts to do both of these. The chapters more or less follow the chronological development of SCK CEN, from the post-war period to 2022. Yet the book does not strive for comprehensiveness in this aspect. It was more important to look for the motivations that determined the history of SCK CEN. These motivations can be linked in part to the actions of individuals who left their mark on policy and research. Less tangible, but perhaps of greater significance, the economic, political and social climate in Belgium also played a vital role. Finally, the book also highlights the international context in which SCK CEN should be situated.

To what extent have the structure and operations of SCK CEN changed? Throughout the Centre's history, a significant degree of continuity can be observed. This is not surprising given the vast scale of the research infrastructure, which cannot accommodate drastic changes. The current reactors BR1, BR2 and Venus have been in operation since 1956, 1962 and 1964. The site's original buildings still define the look of the Centre, although the original layout has been hugely extended over the years. Another form of continuity lies in the Centre's governing bodies. With rare exceptions, directors were always elected from among the Centre's own employees, who consequently continued to build on the same ideas as their predecessors. Yet there was also change. The remit of SCK CEN, which was clearly defined at the start of the nuclear age, needed to be redefined after all Belgian power plants had been put into operation. The reform of the Belgian state very nearly led to the complete closure of the Centre, and the varying successes and setbacks of European cooperation meant that policies were continually adapted. As of 2022, SCK CEN is a market-oriented research institution, closely linked to the academic world, and with a worldwide network of partners and customers. This book explains the path that SCK CEN has taken to arrive at this position.

It is not intended to be a chronicle of SCK CEN. The Centre's activities are too diverse and numerous to cover them all. In the 1980s, there was talk of no fewer than 200 (!) programmes running concurrently. As an author, I was obliged to choose programmes or themes that were either dominant at a given time or that could be considered characteristic of a time period or evolution. I also gave preference to topics that are of interest to a wide audience. Of course, this does not do justice to the multi-faceted nature of the Research Centre, which is specialised in technical-scientific research. I hope that this approach can help clarify the strategic decisions that SCK CEN has made throughout its history.

Various historical questions underpin the structure of the book. The first question concerns the introduction of Big Science into Belgian science policy institutions. The scale (and cost) of SCK CEN were unprecedented in Belgian science, which had hitherto been shaped primarily by universities and a few national research institutions. SCK CEN cannot be described in the same way as a university institution. As the representative of Big Science in Belgium, SCK CEN occupies a unique position, which has not yet been examined. The relationship between state and industry, the use of nuclear diplomacy in relations with European partners and foreign powers, and the privileged position of nuclear experts in post-war Belgium are covered in different chapters. The chronic problems of funding and governance are also a recurring theme in the long history of SCK CEN. Forms of Big Science, introduced by the United States after World War II, are generally regarded as essential institutions in modern science, but for truly large (nuclear) institutions, in Europe, the UK and France in particular come to mind. In this regard, one can still question whether there is actually Big Science on the much smaller Belgian scale (where, unlike the above-mentioned countries, nuclear research was not linked to military objectives). Nevertheless, taking into account the limited scale of a small country, this book aims to situate SCK CEN in the context of the international Big Science movement in Europe.

The second question that has shaped my approach to the history of SCK CEN is the great turnaround in the 1980s and 1990s that historians sometimes refer to as the New Big Science. Many large-scale institutes established immediately after the war lost their original purpose after a few years, either due to the saturation of the research market or because of the economic rationale of higher costs and falling revenues. Some institutes closed, others focused on new areas of research and opened their infrastructure to external researchers. This process played out internationally in the last quarter of the 20th century. SCK CEN also went through a deep crisis around 1990, which cannot only be explained by a few unique circumstances (such as the reform of the Belgian state, the winding down of large international programmes, the rise of anti-nuclear movements and the damaging fallout of a scandal involving illegal practices), but should rather be regarded as an 'identity crisis'. What future, people wondered, could there be for SCK CEN after the Belgian nuclear power plants had been built and no new developments were to be expected for the coming decades? What new position could SCK CEN occupy in the Belgian and international scientific and industrial landscape? This identity crisis, which developed around 1990, was a pivotal moment in the history of SCK CEN.

A third consideration in writing this book was the desire to connect the history of SCK CEN with Belgian history. I therefore gave consideration to the way SCK CEN was discussed by politicians and in the media, even if in many cases these were topics of little apparent relevance to scientific research: social unrest, linguistic quarrels, political conflicts, or the nuclear phase-out. As we will see, these issues did contribute to the decision-making space in which policymakers could manoeuvre to set a course. Nevertheless, the focus of this book remains SCK CEN. This book is not a history of the debate on nuclear energy in Belgium. As an independent scientific institute, SCK CEN has almost never become involved in social debates on the future of nuclear energy.⁹ At the same time, SCK CEN has always vigorously defended the importance of nuclear research, and has never considered removing the word 'nuclear' from its name, for example. Various proposals to this effect were put forward by the political arena, and a number of foreign institutes did actually remove the word 'nuclear' from their name. SCK CEN continues to explicitly profile itself as a nuclear institute, although the emphasis is increasingly on a wide range of nuclear applications, from nuclear safety and nuclear medicine to fundamental nuclear research.

The final thread in the book is the question of the role of science in Belgian society. Nuclear energy is a uniquely technical subject that lends itself poorly to public debate. How can a society deal with the power of scientists who therefore hold the keys to the future? How can scientists achieve a broad consensus in society when the content of their message is difficult to disseminate? This is not a unique feature of the nuclear debate, but a general challenge for modern science- and technology-based societies. In this context, historians refer to a culture of experts, in which the pendulum can swing to a purely technocratic regime, or to a futile debate between experts with opposing viewpoints. The relationship between expert and layperson is a crucial theme in thinking about science for the coming decades. Throughout its history, SCK CEN has also demonstrated what is sometimes referred to as an elitist expert culture, which has sometimes led to both frustrations and unrealistic expectations among observers.

The questions raised above are not explicitly themed in the chapters. First and foremost, I have endeavoured to provide a readable and informative overview of the history of the Research Centre. Tentative answers to the themes addressed can however be found in the epilogue. The book is divided into seven chapters. The first chapter tells the by now familiar story of the origins of SCK CEN, which grew out of the

⁹ E. Laes et al., *Kernenergie (on)besproken. De geschiedenis van het maatschappelijk debat over kernenergie in België* (Leuven, 2007).

uranium agreement between Belgium, the United States and the United Kingdom. The second chapter looks at the training of nuclear experts in Belgium, the guiding role of Belgian industry and the share of the fledgling SCK CEN in the activities of Euratom. The third chapter covers SCK CEN's first crisis, when government and industry were at loggerheads regarding the governance of the Centre. The fourth chapter focuses on the major European projects in which SCK CEN had a stake, on behalf of Belgium. The expectations were high, but the costs quickly mounted. The energy crisis of the 1970s and the subsequent economic recession put an end to these projects. A dramatic low point in the history of SCK CEN was reached in the 1980s. Chapter 5 weaves together the various strands that led to this crisis. Chapter 6 and Chapter 7 then outline the 'resurrection' of what was christened the 'new' SCK CEN. This new SCK CEN was characterised by its connection with the academic world, the emphasis on research in addition to providing services, and a focus for the societal aspects of nuclear energy. It was against this backdrop that the MYRRHA project saw the light of day, finally receiving the green light from the federal government in 2018 after nearly two decades of negotiations.

A number of practical decisions were made to enhance the readability of the book. At its founding in 1957, the SCK CEN was given its title in both national languages: the Studiecentrum voor Kernenergie (Research Centre for Nuclear Energy) – Centre 'd'étude de l'Énergie nucléaire, abbreviated to SCK or CEN. In Dutch-language sources, the Dutch name or abbreviation was systematically used, in French-language texts the French name and abbreviation. From the 1990s onwards, representatives of the Centre increasingly used a double acronym, written as SCK/CEN, SCK-CEN, SCK·CEN, depending on the language used also in reverse order. Nevertheless, in newspapers and political texts, the use of the monolingual abbreviation SCK or CEN remained dominant. The Centre recently confirmed that SCK CEN would become the official acronym. In this book, we have opted to use this acronym systematically for the entire period under review. Naturally, in citations, the original text is always reproduced verbatim, including the designation or acronym used therein.

In the history of a Big Science institution, finances obviously play an important role. A modern equivalent in euros has been added to all amounts mentioned in this book wherever possible. This equivalent was calculated on the face value of the amount according to the conversion EUR 1 = BEF 40.3399, and then rounded up. This conversion is only intended to give the present-day reader an idea of the scale of the amounts mentioned. The conversion does not take into account inflation or the devaluation of the Belgian currency in 1982. Figures, therefore, must be used with caution. For example, in 1955 the operating grant that SCK CEN received from the Ministry of Economic Affairs was BEF 108 million. In nominal terms, this

corresponds to EUR 2.67 million, but corrected to today's currency value, i.e. taking into account inflation and devaluation, the amount is equivalent to EUR 22.6 million.¹⁰

The history recounted in this book is very recent. This poses a number of challenges for the historian. Not all archival sources are publicly accessible, on account of both legal restrictions and the lack of a structured inventory. The absence of historical distance from the events sometimes makes interpreting the sources a perilous undertaking. I have given preference to citing sources that are publicly available and relatively easy to look up. Time constraints meant that it was not possible to conduct systematic research in the archives of European organisations or international partner institutions, for instance. Similarly, I did not find it relevant to incorporate interviews of people who are still alive into a narrative that seeks to look at events with a certain distance. Consequently, it is difficult to regard the book as the definitive history of SCK CEN; it is rather an initial preliminary study to which more detailed research can subsequently be added.

This book was written at the request and with the financial support of SCK CEN. However, the Centre did not in any way influence the selection of themes or the conclusions drawn, for which I am grateful. A number of chapters are based on research conducted by Robert van Leeuwen and Hein Brookhuis in the context of doctoral research at KU Leuven. I would like to thank them for their input and recommendations. I would also like to thank my interlocutors at SCK CEN, in particular Anne Verledens, who meticulously proofread the manuscript. Robbe Geysmans, Gaston Meskens and Michèle Coeck followed the progress of the manuscript with great interest and encouraged me to clarify or nuance overly simple representations. My thanks also go to the undergraduate students of history at KU Leuven who, in the challenging Covid year 2020-21, wrote a thesis on a theme as unfamiliar to them as nuclear science, politics and technology in Belgium. Writing is a solitary labour, in which I was fortunate to have the support of my family. This book is dedicated to them in gratitude.

¹⁰ Calculated based on the consumer price index, see bestat.statbel.fgov.be.

