

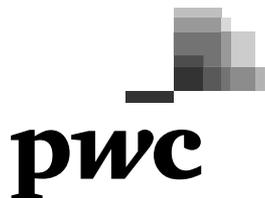
strategy&

# *PALLAS / LightHouse Review*

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## Extract of final report

11<sup>th</sup> April 2018



Ministerie van Economische Zaken

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# *Disclaimer*

*We report on PALLAS and LightHouse (the “Companies”) in accordance with our proposal dated January 12th 2018, and your confirmation of this proposal by the decision dated January 17th 2018 (the “Contract”). The Dutch Ministry of Economic Affairs and Climate Policy, on behalf of “hoogambtelijke werkgroep nucleair landschap”, has asked Strategy& to conduct a high-level evaluation of the potential impact of the LightHouse initiative on the PALLAS initiative business case and vice versa (which are both under development) and to review potential (dis)advantages for combining the initiatives. Strategy& has prepared a strictly private and confidential report (the “Report”) in accordance with the Contract. The Report has been prepared for the sole benefit and use of the Client and not for the interests or priorities of any third party. The Report is confidential.*

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# Our scope and process

## Depth of assessment<sup>66</sup>



Due to the short ~4 weeks evaluation and wide range of activities we had to cover, the depth of our assessment is limited. Our evaluation was based on our existing technological, financial, economic and market knowledge combined with the understanding of the main business case assumptions of the PALLAS and LightHouse business cases. Whilst the PALLAS initiative is based on a proven technology and its business case is relatively detailed, the LightHouse initiative is based on technology that is not yet proven and its business case is more high-level and lacks detailed underpinning of technical, financing, economic and organizational aspects.

## Access to management



In general, we have had good access to the steering committee (with representatives from Ministries: EZK, VWS and FIN) and PALLAS management. However, access to LightHouse management has been delayed at the start of our field work and has been limited to one meeting in the final week of our field work.

## Access to information



Information has been provided by the Ministerie EZK. Detailed PALLAS information was received (Business Case 3.0). Initial high-level LightHouse information was provided at the beginning of the engagement and financial model was provided in the final week of our engagement.

## Clarity of information



PALLAS and LightHouse represent initiatives that are in their preparation phases and the business cases are based on assumptions and expectations that are not yet validated. Information provided, together with access to management, has allowed us to gain insight and understanding into the PALLAS business case, the initiative's readiness level and its socio-economic, financial and technical benefits. We have not been able to obtain the same level of insight from the information provided by the LightHouse initiative, as limited information was shared and substantiation of underlying assumptions could not be verified.

## Important scope comments and guidelines for use of this report

The conclusions of this report are conditional on the fact that LightHouse is technically feasible (which cannot yet be assessed and remain unchanged vis-à-vis 2017 PALLAS business case 3.0 evaluation) and business case assumptions for PALLAS and LightHouse are directionally correct. Useful information for the interpretation of our Reports is presented in the appendix.

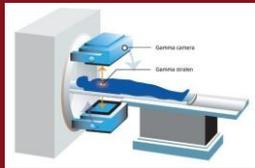
# Medical isotopes are critical for diagnostic and therapeutic purposes and can be produced through various technologies

## Introduction



### What are medical isotopes?

- Nuclear medicine plays a key role in diagnostic imaging (SPECT, PET) and therapies, such as the treatment of cancers
- Supply of these medical isotopes is highly time critical, as the activity of isotopes decays over time
- As a result, sufficient and reliable production capacity is crucial



### Diagnostic market

- Major nuclear imaging technologies are SPECT (based on Mo-99) and PET (based on F-18)
- The diagnostic market is relatively mature with ~400,000 procedures per year in the Netherlands, of which the vast majority is Mo-99 based



### Therapeutic market

- Isotopes are mainly used for treatment of cancers – often these nuclear medicine offer a less invasive technique than existing treatments
- Therapeutic nuclear medicine is an emerging and fast growing market, with currently ~4,000 treatments per year in the Netherlands, but many new medicine under research (based on Lu-177, Ho-166, etc.)



### Production routes

- Currently, the majority of isotopes is produced with nuclear reactors
- As an alternative, Mo-99 can be produced with accelerators, which produce less nuclear waste but are generally considered to be more expensive
- New techniques (e.g. LightHouse) might however substantially improve production volume, potentially offering a low-cost and superior production route

# *PALLAS and LightHouse are competing initiatives to supply medical isotopes; both seeking government dedicated support*



- PALLAS initiative was proposed in 2011 by NRG as a potential replacement to the existing High Flux Reactor (HFR) as this approaches end of life in 2025
- PALLAS intends to supply therapeutic and diagnostic medical isotopes to the market using a fission reactor; a proven technology with a strong track record for producing medical isotopes
- PALLAS aims to be privately financed with a combination of debt and equity investors
- Business case for private investors is moderately attractive with a moderately attractive IRR, significant uncertainties and long time to revenue
- Progress has been made to bring the PALLAS initiative closer to realization with an established organization, funding (loan) from Dutch government and comprehensive business and financing plan – construction was awarded to a consortium in January 2018 after a competitive tender procedure
- PALLAS is approaching a go/no-go in Q2 2018 where a decision will be made by the government to support PALLAS with the next tranche of funding to progress design and engineering of the new reactor

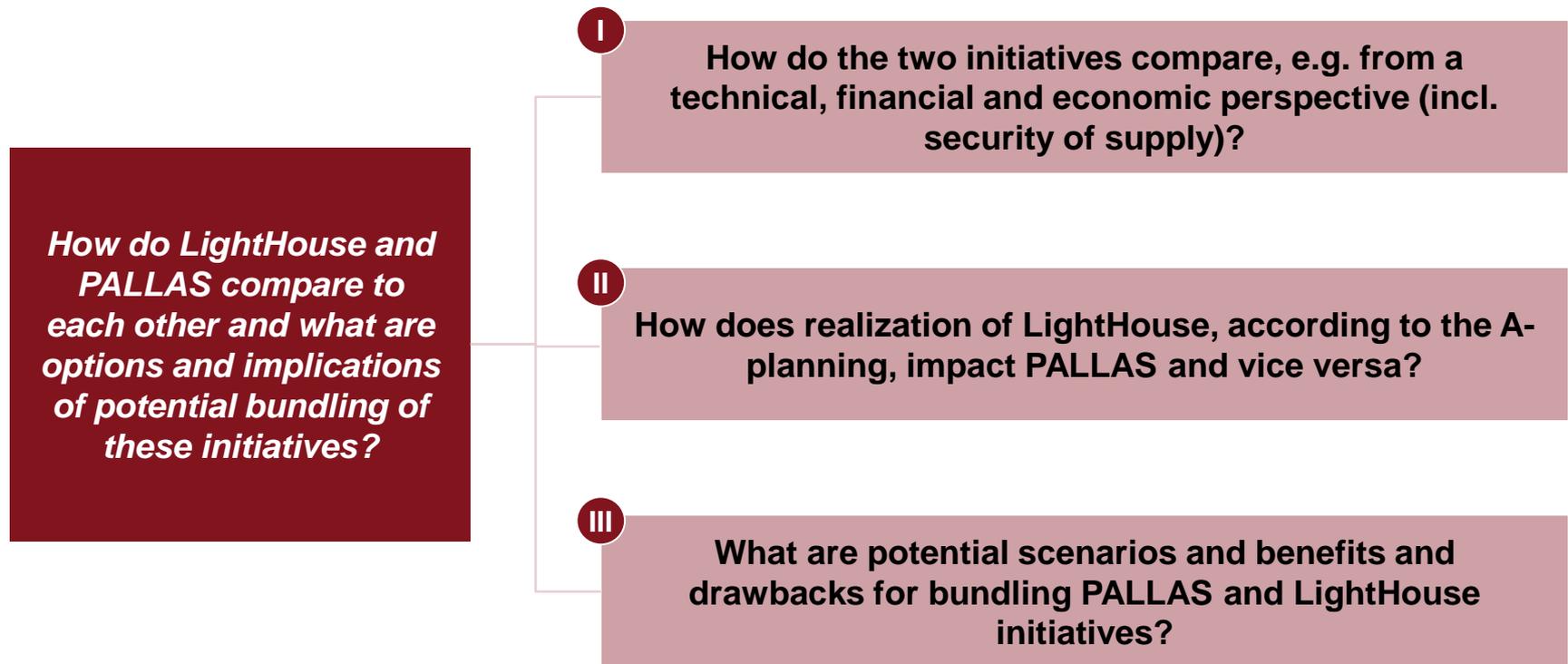


- In 2016, ASML proposed an alternative approach to reactor based production that could produce similar volumes of diagnostic isotopes at significantly lower cost and with no nuclear waste
- LightHouse remains in early stages of development and significant work is required to demonstrate the technical feasibility and overcome potential technical and system integration challenges
- If technically feasible and if business case assumptions are directionally correct, the LightHouse initiative would offer a lower cost and clean waste alternative for the supply of Mo-99 and challenge the incumbent fission reactor based production route
- The Dutch government supported the initiative by proclaiming it National Icon 2016
- A recent partnership announcement with IRE provides LightHouse with access to an established customer base and industry expertise – however, additional funding is likely needed to further progress the initiative
- LightHouse is progressing technical feasibility risk mitigation assessment in 2018 and is seeking additional financial support from the Dutch government

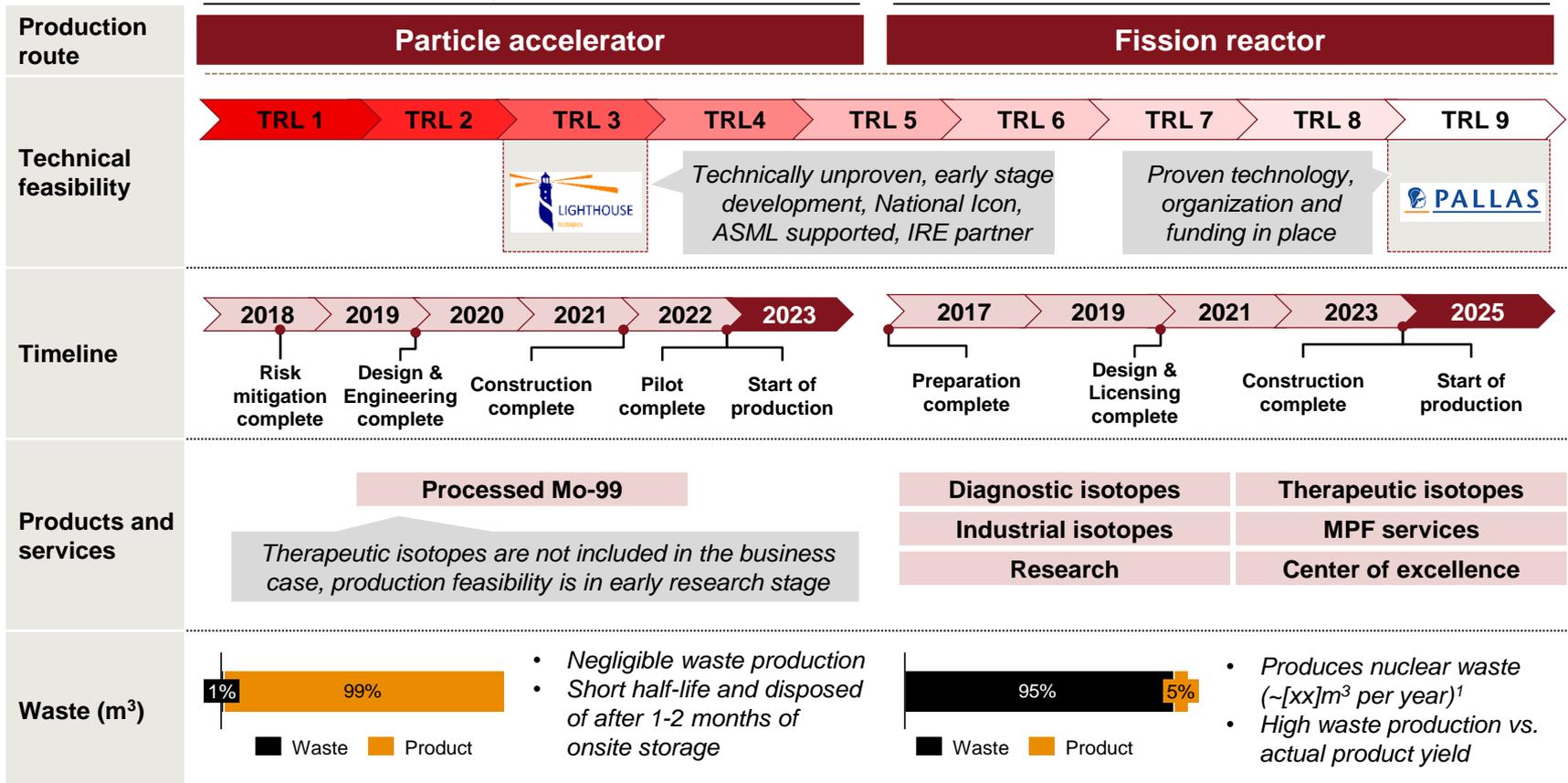
# *In this context, the Ministry requested a comparison of PALLAS and LightHouse and an evaluation of scenarios incl. bundling*

## Main project objectives

## Underlying questions



# PALLAS and LightHouse are developing different technical solutions with distinct medical isotope supply capabilities



1) Excluding decommissioning waste

Source: LightHouse Projectplan, PALLAS Business Case 3.0, Strategy& analysis

# *LightHouse may offer a lower cost and clean alternative to PALLAS – yet, it is not proven and targets Mo-99 supply only*

1 Readiness to realize	2 Scope of isotope supply									
<p> <b>PALLAS</b></p> <ul style="list-style-type: none"> <li>Progressing well to realizing a fully operational facility by 2025 to produce medical isotopes</li> </ul> <table border="1" data-bbox="119 515 935 554"> <tr> <td>Tech. solution</td> <td>Business case</td> <td>Organization</td> <td>Gov. support</td> <td>Partners</td> </tr> </table>	Tech. solution	Business case	Organization	Gov. support	Partners	<p> <b>PALLAS</b></p> <ul style="list-style-type: none"> <li>Production of the full range of diagnostic and therapeutic isotopes and support development of nuclear medicine</li> </ul> <table border="1" data-bbox="1014 515 1812 554"> <tr> <td>Diagnostic</td> <td>Therapeutic</td> <td>COE for nuclear medicine</td> <td>Supply chain int.</td> </tr> </table>	Diagnostic	Therapeutic	COE for nuclear medicine	Supply chain int.
Tech. solution	Business case	Organization	Gov. support	Partners						
Diagnostic	Therapeutic	COE for nuclear medicine	Supply chain int.							
<p> <b>LIGHTHOUSE</b></p> <ul style="list-style-type: none"> <li>Still in very early stages of development and organization set-up with significant uncertainties re. technical capabilities</li> </ul> <table border="1" data-bbox="119 715 935 753"> <tr> <td>Tech. solution</td> <td>Business case</td> <td>Organization</td> <td>Gov. support</td> <td>Partners</td> </tr> </table>	Tech. solution	Business case	Organization	Gov. support	Partners	<p> <b>LIGHTHOUSE</b></p> <ul style="list-style-type: none"> <li>Focused production on Mo-99 only; production feasibility of therapeutic isotopes in early research stage</li> </ul> <table border="1" data-bbox="1014 715 1812 753"> <tr> <td>Diagnostic</td> <td>Therapeutic</td> <td>COE for nuclear medicine</td> <td>Supply chain int.</td> </tr> </table>	Diagnostic	Therapeutic	COE for nuclear medicine	Supply chain int.
Tech. solution	Business case	Organization	Gov. support	Partners						
Diagnostic	Therapeutic	COE for nuclear medicine	Supply chain int.							
3 Financial merit	4 Socio-economic impact									
<p> <b>PALLAS</b></p> <ul style="list-style-type: none"> <li>Indicates a moderately attractive IRR however with long time to revenue and sensitive to uncertain market conditions</li> </ul> <table border="1" data-bbox="119 1001 935 1039"> <tr> <td>Positive IRR</td> <td>Robust against sensitivities</td> </tr> </table>	Positive IRR	Robust against sensitivities	<p> <b>PALLAS</b></p> <ul style="list-style-type: none"> <li>Contributes to Petten diagnostic and therapeutic isotopes cluster development but generates nuclear waste during 40+ years</li> </ul> <table border="1" data-bbox="1014 1001 1812 1039"> <tr> <td>Job creation</td> <td>Petten cluster dev.</td> <td>Clean waste</td> </tr> </table>	Job creation	Petten cluster dev.	Clean waste				
Positive IRR	Robust against sensitivities									
Job creation	Petten cluster dev.	Clean waste								
<p> <b>LIGHTHOUSE</b></p> <ul style="list-style-type: none"> <li>Potentially offers more attractive IRR and may remain attractive even in downside (market) scenarios</li> </ul> <table border="1" data-bbox="119 1200 935 1239"> <tr> <td>Positive IRR</td> <td>Robust against sensitivities</td> </tr> </table>	Positive IRR	Robust against sensitivities	<p> <b>LIGHTHOUSE</b></p> <ul style="list-style-type: none"> <li>Less integrated into existing supply chain however produces negligible nuclear waste</li> </ul> <table border="1" data-bbox="1014 1200 1812 1239"> <tr> <td>Job creation</td> <td>Petten cluster dev.</td> <td>Clean waste</td> </tr> </table>	Job creation	Petten cluster dev.	Clean waste				
Positive IRR	Robust against sensitivities									
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<table border="1"> <tr> <td>Addressed</td> <td>Partially addressed</td> <td>Not addressed.</td> </tr> </table>		Addressed	Partially addressed	Not addressed.						
Addressed	Partially addressed	Not addressed.								

Source: PALLAS Business Case 3.0, LightHouse Projectplan (June 29, 2017)

# Whilst PALLAS is preparing well towards project realization LightHouse is yet unproven and in early development stages

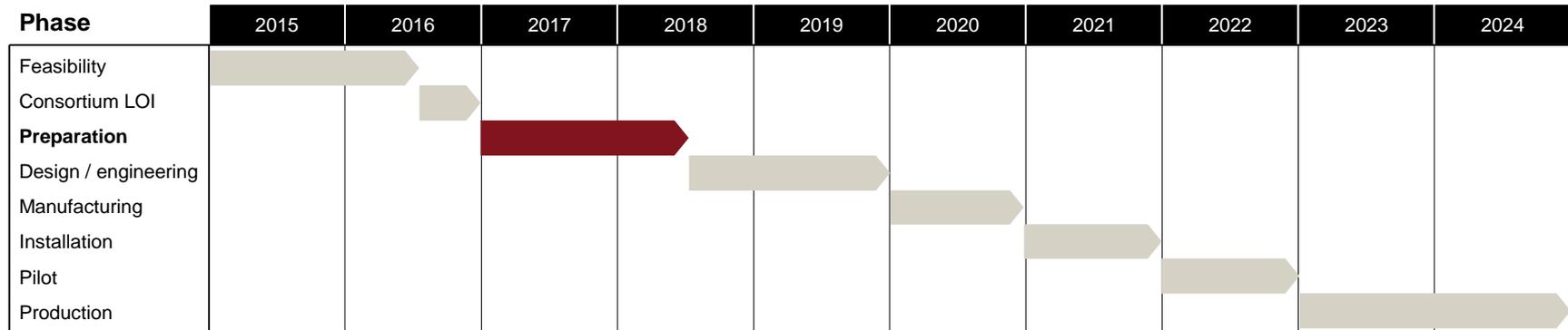


Project readiness	<i>PALLAS is well progressed in preparation with a robust business case, established organization, and government alignment</i>	<i>LightHouse has potential partners, however remains in the early stages of preparation with an unproven technology solution</i>
<b>Technical feasibility</b>	<i>Proven technology and method for medical isotope production</i> ✓	~ <i>Proven Mo-100 (g,n) transition however demonstrated configuration with technical integration challenges and risks</i>
<b>Business case</b>	<i>Well developed business case with substantiated assumptions and business case uncertainties identified</i> ✓	~ <i>High level business case with key market assumptions identified. Sensitivity assessment not performed</i>
<b>Financing / partnerships</b>	<i>Financing strategy under development, no external investors confirmed</i> ~	~ <i>Partnerships with IRE (Mo-99 processor) and ASML with some funding but no financing plan in place</i>
<b>Organization</b>	<i>Initiative organization established</i> ✓	~ <i>CEO in place, but no other FTE on payroll or organization established</i>
<b>Government involvement</b>	<i>Government involvement with initial alignment of technical requirements and initial funding</i> ✓	~ <i>Limited government involvement but received National Icon status in 2016, no government funding received</i>

Source: LightHouse Projectplan, PALLAS Business Case 3.0, Strategy& analysis

# LightHouse timeline seems substantially shorter compared to similar initiatives developing new technologies for Mo-99

## LightHouse timeline



## Timeline comparison

LightHouse vs. other initiatives



- Current preparation phase is funded by IRE and planned to be completed after summer 2018
- This phase contains 5 separate work streams and involves many (20) parties – complicating management of the work
- Other new initiatives for Mo-99 production typically take 10+ years to complete
- LightHouse believes continuous involvement and expertise of ASML will allow them to achieve substantially shorter timelines of ~8 years
- LightHouse considers a lack of funding to be the main risk for realizing these timelines

Source: OECD-NEA 2017; NorthStar, MYRRHA and SHINE project websites; LightHouse Projectplan; Strategy& analysis

# PALLAS targets a broad range of diagnostic and therapeutic isotopes supply whilst LightHouse targets Mo-99 supply only



Technical Scope	<i>PALLAS will produce the full range of medical isotopes and become a center of excellence for medical research in the Netherlands</i>		<i>LightHouse aims to produce processed Mo-99 but does currently not aim to contribute to security of supply of therapeutic isotopes</i>																			
Scope of supply	<table border="1"> <thead> <tr> <th></th> <th>Irradiation</th> <th>Processing</th> </tr> </thead> <tbody> <tr> <th>Diagnostic</th> <td>✓</td> <td>✗</td> </tr> <tr> <th>Therapeutic</th> <td>✓</td> <td>✓</td> </tr> </tbody> </table>		Irradiation	Processing	Diagnostic	✓	✗	Therapeutic	✓	✓		<table border="1"> <thead> <tr> <th></th> <th>Irradiation</th> <th>Processing</th> </tr> </thead> <tbody> <tr> <th>Diagnostic</th> <td>✓</td> <td>✓</td> </tr> <tr> <th>Therapeutic</th> <td>x1</td> <td>x1</td> </tr> </tbody> </table>		Irradiation	Processing	Diagnostic	✓	✓	Therapeutic	x1	x1	
	Irradiation	Processing																				
Diagnostic	✓	✗																				
Therapeutic	✓	✓																				
	Irradiation	Processing																				
Diagnostic	✓	✓																				
Therapeutic	x1	x1																				
Research and development	<i>Contributes to regional center of excellence for continued development of therapeutic nuclear medicine</i>	✓	✗	<i>Research limited to demonstrating production feasibility and excludes contribution to medicine development</i>																		
Integration with existing supply chain	<i>Integrates into existing supply chain to improve stabilization of supply</i>	✓	✗	<i>Limited integration to existing supply chain and potential disrupter to incumbent players</i>																		
Scalability	<i>Opportunity to scale up or down production but limited opportunity to reduce capacity and CapEx</i>	~	✓	<i>Lower minimal capacity and modularity to add beamlines</i>																		

1) LightHouse is investigating the possibility to produce therapeutic isotopes, e.g. Lu-177  
 Source: LightHouse Projectplan, PALLAS Business Case 3.0, Strategy& analysis

# Even if LightHouse is capable of producing Mo-99 it is not expected to produce therapeutic isotopes in the short/mid term

## Expected scope of supply of medical isotopes



Isotope <sup>1</sup>	Relevance <sup>2</sup>	PALLAS	LIGHTHOUSE Isotopes
<b>Diagnostic Isotopes</b>			
Tc-99m (Mo-99)	High	✓	✓
<b>Therapeutic Isotopes</b>			
Lu-177	High	✓	✗
I-131		✓	✗
Ir-192		✓	✗
Ra-223	Medium	✗	✗
I-125		✓	✗
Y-90		✓	✗
Ho-166		✓	~
Kr-81m		✗	✗
Re-188		~	✗
Sm-153	Low	✓	~
Cr-51		✗	✗
Er-169		✗	~
Re-186		~	~
P-32		✗	✗
Co-60		✗	✗
Sr-89		✓	✗
Cu-64		~	~

Therapeutic isotopes are not included in the business case, production feasibility is in early research stage

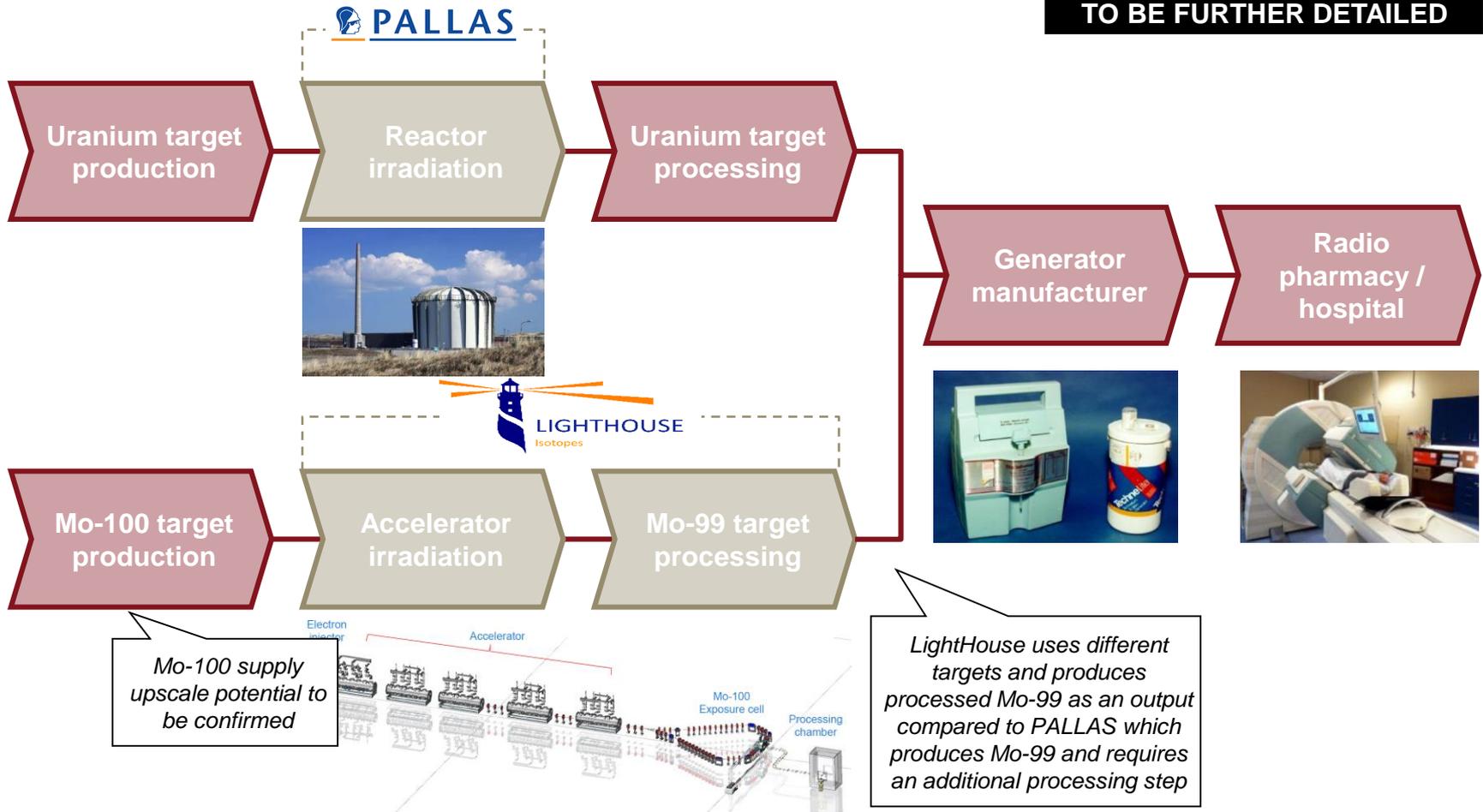
**Legend:** ✓ in scope / technical requirements      ~ to be evaluated / unknown      ✗ not in scope / unlikely to be feasible

1) Selected isotopes in RIVM report; isotopes generally produced in cyclotrons (e.g. F-18) not included. 2) Indication of relevance based on # of patients, growth and applications  
 Source: RIVM, LightHouse Projectplan, PALLAS team, Strategy& analysis

# LightHouse would eliminate need for additional processing step, creating an advantage compared to the PALLAS route

Value chain PALLAS versus LightHouse

**INTEGRAL COST COMPARISON TO BE FURTHER DETAILED**



Source: LightHouse Projectplan, Strategy& analysis

# Finally, LightHouse would offer a clean waste alternative vis-à-vis PALLAS which contributes to nuclear waste build-up

## Highly radioactive waste<sup>1</sup> in NL

- Roughly a third of the current annual highly radioactive (HRA) waste production is related to nuclear medicine
- PALLAS will produce ~ [xx] m<sup>3</sup> HRA waste per year of operation, while LightHouse technology will not produce any HRA waste
- Nuclear waste remains a very sensitive subject:

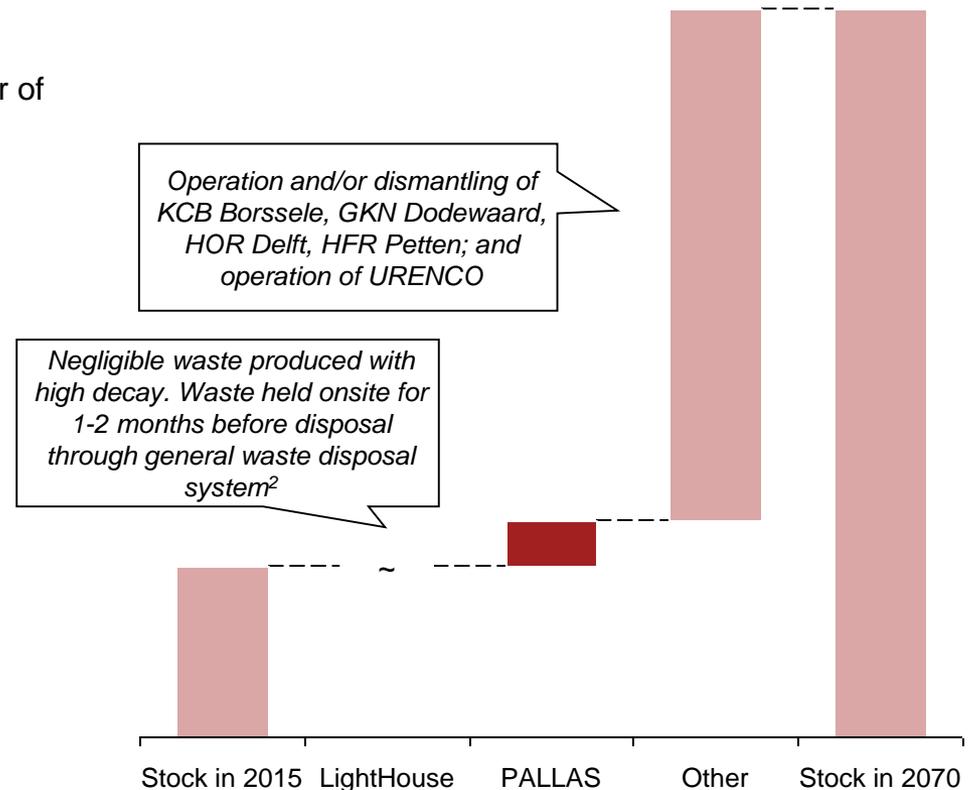
“Greenpeace protesters delay Dutch nuclear waste train”

*The Netherlands – bbc.com, 2011*

“Groot protest tegen Belgische kerncentrale: 50.000 mensen vormen ketting in drie landen” – *volkskrant.nl, 2017*

“Wensdenken over de opslag van kernafval is gevaarlijk”  
– *nrc.nl, 2018*

## Cumulative production of HRA waste<sup>3</sup> m<sup>3</sup> over period 2015-2070, COVRA estimates



1) RIVM classifies nuclear waste as 'Hoogradioactief Afval' (HRA) if it very long-lived and highly active (corresponds to definition IAEA: high and intermediate-level waste).

2) According to LightHouse management.

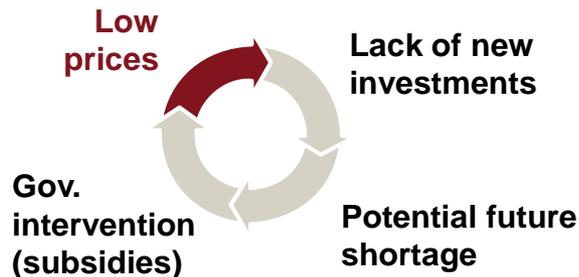
3) Excluding decommissioning waste.

Source: COVRA, RIVM, Strategy& analysis

# *Mo-99 has historically been supplied below cost levels – continued subsidies hamper realization of new capacity*

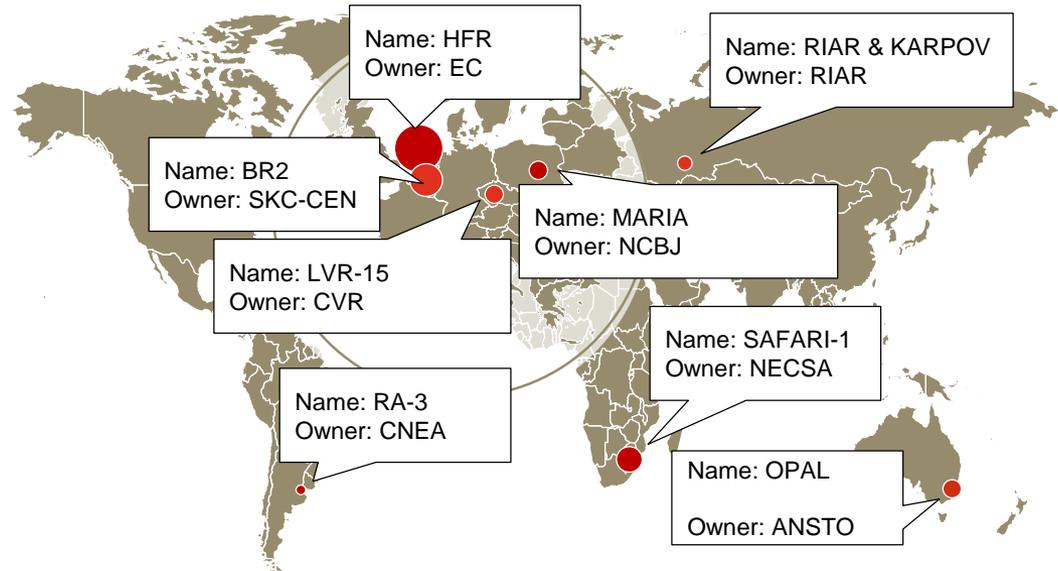
## Mo-99 pricing dynamics

- Historically, governments have financially supported nuclear (research) reactors as these involve public interests
- Most of the existing reactors are still publicly owned
- As Mo-99 was originally produced as a by-product of nuclear research, and costs were often covered by research subsidies, Mo-99 was supplied below cost levels
- Although Mo-99 is no longer merely a by-product, historic low costs have resulted in a vicious circle of continued subsidy provision:



## Ownership structure

Current reactors used to produce Mo-99



**Fully Public owned**

HFR is owned by EC, while OPAL, MARIA, SAFARI-1 & RA-3 are owned by national governments directly (e.g. through government agencies)

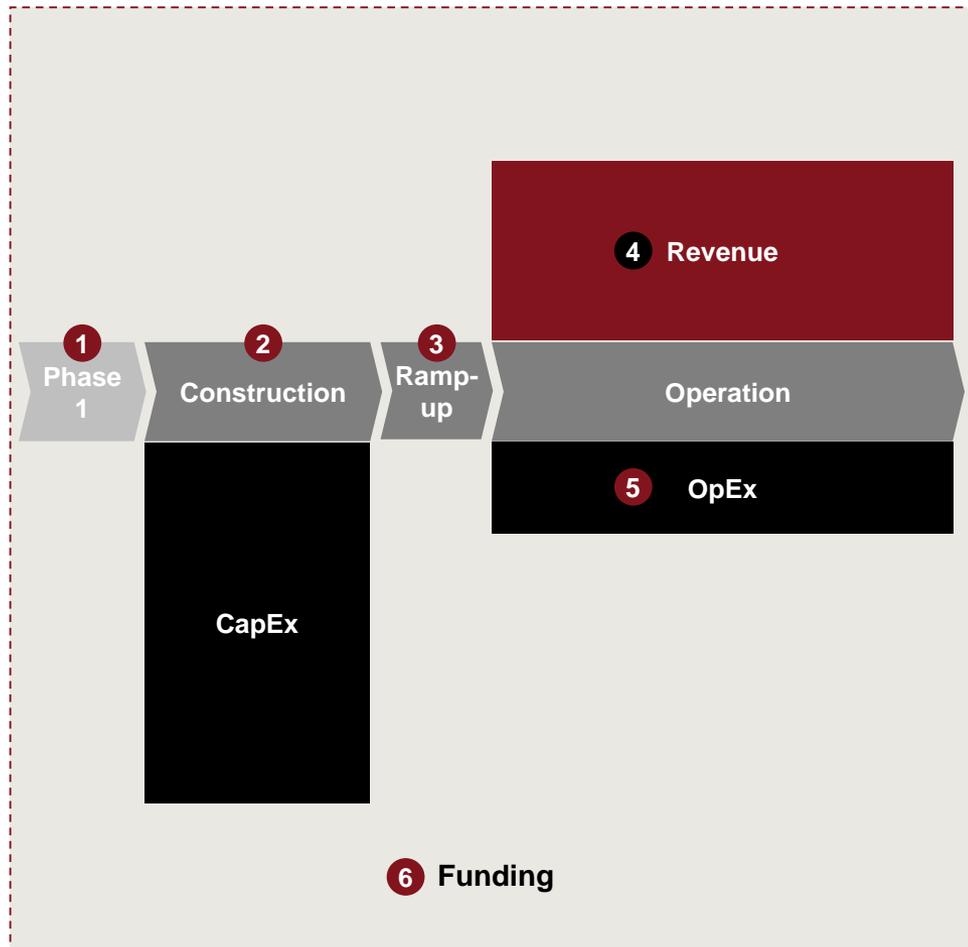
**Indirectly Public owned**

LVR-15, BR-2, RIAR & KARPOV are owned by independent research institutes that are indirectly controlled by the government

# There appears to be limited synergy from combining the initiatives and to scale down or reconfigure PALLAS

## Potential points of synergy

**PRELIMINARY**



Evaluation of potential synergy	
1	<ul style="list-style-type: none"> <li>Limited synergy in licensing (different license required) and design, engineering and R&amp;D expenses (different technological challenges)</li> </ul>
2	<ul style="list-style-type: none"> <li>PALLAS: negligible CapEx decrease if Mo-99 capacity is excluded or reduced</li> <li>LightHouse: could reduce CapEx by operating only a single beamline</li> </ul>
3	<ul style="list-style-type: none"> <li>LightHouse could potentially serve as back-up during ramp-up of PALLAS, but HFR would serve as a more logical back-up (equal end-product, unprocessed Mo-99)</li> </ul>
4	<ul style="list-style-type: none"> <li>There is potential for price uplift for both PALLAS and LightHouse if the two initiatives were to collude to improve price level</li> </ul>
5	<ul style="list-style-type: none"> <li>Operational cost synergies appear to be limited to some management and commercial FTE, which are a relatively small part of total costs</li> </ul>
6	<ul style="list-style-type: none"> <li>Funding of a joint initiative will prove difficult as joint IRR is not likely to surpass LightHouse standalone IRR</li> </ul>

Source: LightHouse Projectplan, PALLAS Business Case 3.0, Strategy& analysis

# *It is expected that integration challenges may be experienced if the initiatives are to be combined*

## Expected integration challenges

**PRELIMINARY**

### 1 Lack of synergies

- While LightHouse could leverage PALLAS know-how to accelerate its development, there appear to be limited other commercial or operational synergies from combining PALLAS and LightHouse

### 2 Asymmetrical benefits

- There seems to be little upside for Lighthouse, which is expected to be cost advantaged compared to PALLAS, yet still faces competition from legacy/non-FCR compliant reactors that operate at lower short-run marginal costs

### 3 Regulation

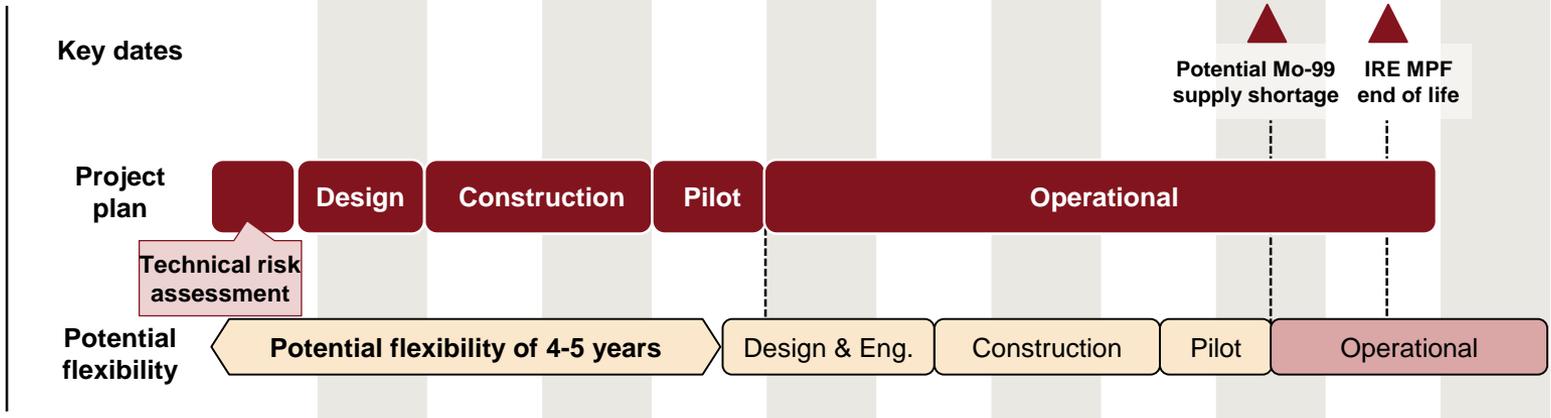
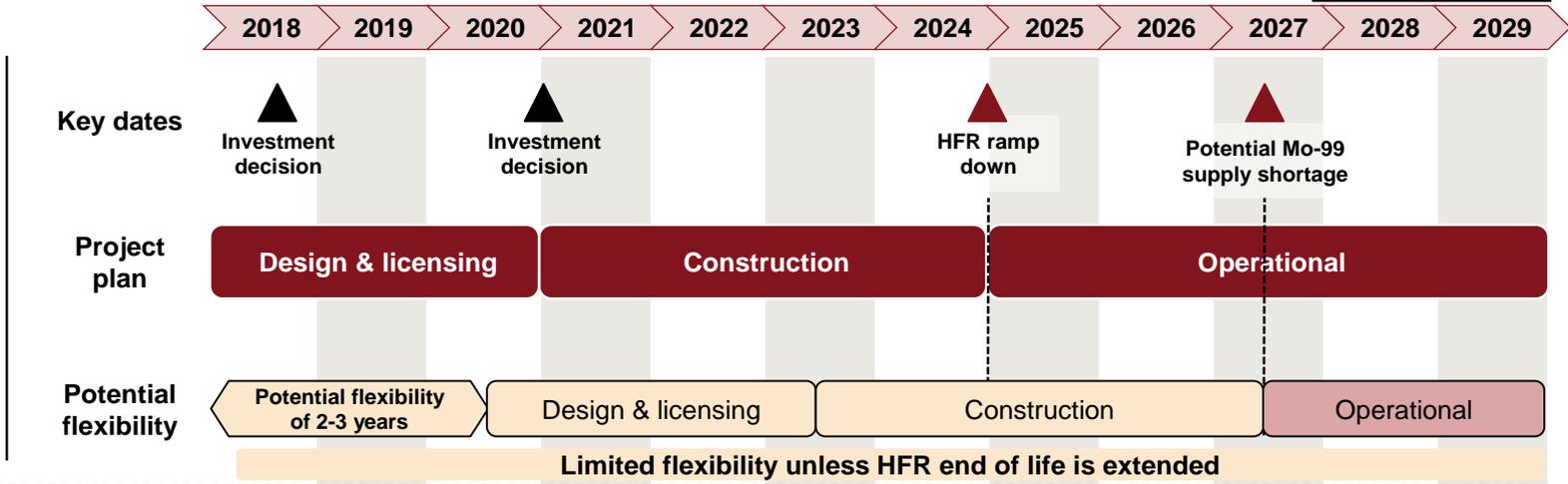
- The combination may be viewed as a move by PALLAS to kill a more efficient competitor and not be permitted by EU and Dutch competition law or to eliminate competition

### 4 Financing

- It will be more difficult to attract financial investor interest for a combined investment of which one part has a substantially lower IRR than the other

# There appears to be limited flexibility in PALLAS' timeline – yet more clarity on LightHouse is expected by mid 2018

**PRELIMINARY**



Source: LightHouse projectplan, PALLAS Business Case 3.0, Strategy& analysis

# *Progressing with PALLAS creates an option to secure isotope supply and time for further investigations until 2020*

## Main conclusions

- 1 There does not seem to be an immediate need to change the short-term planning of PALLAS
  - There is currently too much uncertainty about the feasibility and capability of LightHouse
  - The next tranche of funding is required by PALLAS to progress design and licensing, target to achieve private financing and start of production by 2025 and guarantee supply of isotopes
  - Main investment decision for PALLAS will not be until start of construction in ~2021, at which point more clarity exists on financeability of PALLAS and on LightHouse potential
- 2 LightHouse has the potential to offer advantages (lower cost and cleaner waste) for the production of Mo-99; however, certainty about its technical feasibility, time to realize, and financing is required to assess the opportunity
- 3 LightHouse requires financial support to assess technical feasibility, develop the business case and build the organization, and should explore the various private and public funding options it has available
- 4 The government should evaluate LightHouse's request for involvement and support on its own merits; however, given the PALLAS timeline it will benefit from fast tracking LightHouse preparations and technical feasibility study
- 5 An additional review of PALLAS and LightHouse and evaluation of scenarios may be required in ~2020 when additional technical feasibility and business plan information of LightHouse should be available – however, the supply and demand of therapeutic isotopes is likely to still remain highly uncertain in 2-3 years time

# *Appendix*

# ***Most isotopes are used for diagnostics or treatment of serious illnesses, and alternatives are often unavailable***

## **Overview of isotopes**

<b>Isotope</b>	<b>Patients</b>	<b>Growth</b>	<b>Application(s)</b>	<b>Alternatives</b>
Tc-99m	~ 400,000	+	Diagnostics (>80% of diagnostic procedures)	None
Lu-177	~ 1,000	++	Several types of cancer (including metastases)	None
I-131	~ 2,000	+	Thyroid cancer and other thyroid illnesses	None
Ir-192	~ 2,000	=	Several types of cancer	External radiotherapy
Ra-223	~ 1,000	+	Bone metastases	None – alternatives (Lu-177, Re-188) under research
I-125	~ 1,000	+	Several types of cancer	Invasive alternatives
Y-90	~ 200	++	Several types of cancer, chronic joint inflammation	Chemotherapy – alternatives (Ho-166) under research
Ho-166	~ 50	+	Liver cancer	Y-90
Rb-82	~ 4,000	+	Heart perfusion research	O-15, N-13, Tc-99m
Kr-81m	~ 600	=	Lung ventilation research	Spin-polarised He-3 or Xe-129
Re-188	~ 100	=	Bone metastases (palliative)	Sm-153, Sr-89, opiates
Sm-153	~ 100	=	Bone metastases (palliative)	Re-188, Sr-89, opiates
Cr-51	~ 100	=	Several gut illnesses, diagnostics related to kidney transplants and blood illnesses	None
Er-169	~ 10	(+)	Chronic joint inflammation	Y-90, Re-186
Re-186	~ 10	(+)	Chronic joint inflammation	Y-90, Er-169
P-32	~ 20	=	Several blood illnesses, several types of cancer (palliative)	None
Co-60	Unknown	=	Brain metastases, equipment calibration	None – in the future, proton therapy
Sr-89	~ 20	-	Bone metastases (palliative)	Re-188, Sm-153, opiates
Cu-64	0	(+)	Potential PET-tracer, pharmacokinetic research	Unknown

Source: RIVM, Strategy& analysis

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## ***Scope and process: supplementary information***

### **Scope and scope exclusions agreed in the engagement letter**

This report presents the final outcome of the work we agreed to perform in accordance with the engagement letter dated 17<sup>th</sup> January 2018. This report contains our evaluation of the PALLAS and LightHouse initiatives to produce and supply medical grade radioactive isotopes. It also contains an evaluation of the integration opportunities for the two initiatives

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### **Amendments to the agreed scope**

There were no significant amendments to the scope agreed in the engagement letter.

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### **Last day of fieldwork**

The fieldwork for this report was completed on Friday 9<sup>th</sup> February 2018 in preparation for the final presentation of our evaluation of the LightHouse and PALLAS business cases

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### **Approach**

Our initial work was performed over a 20 day period commencing 15<sup>th</sup> January 2018. After receiving the available information from PALLAS and the Ministerie EZ, we performed a kick-off call with both the Ministerie EZ and PALLAS. In the final week, we met with LightHouse to discuss their plan

PALLAS have been available for additional clarification throughout the engagement, LightHouse management have been more difficult to engage effectively.

# *Guidelines for the use and interpretation of our Reports*

## **Guide for the correct interpretation of the “Our scope and process” pages in the report**

- This extract has been created at the request of the client
- and aims to communicate those matters which we believe are important when evaluating the findings of our work. They are directional indicators and are not absolute measures. Whilst inevitably subjective these observations set the overall context and framework against which the views expressed in our report should be assessed. The four main areas we assess are: 1) scope, 2) access to management, 3) access to information and 4) the clarity of information.
  - Our scope typically ranges from “limited” to “extensive”. Our scope describes the period covered and gives an overall insight in the areas covered. Full detail of the scope is provided in the engagement letter enclosed in these Appendices
  - Access to management typically ranges from “none” (e.g. no access due diligence) to “good” (e.g. open, direct, unsupervised access to all necessary members of management). Our assessment is based upon the transaction process, the level of direct access we were granted to the relevant members of management, as well as our observations as to the openness of the lines of communication.
  - Access to information typically ranges from “limited” (e.g. only the information memorandum, perhaps supplemented with some supporting schedules) to “extensive” (e.g. access to all the relevant data, supporting management schedules, and relevant specialists). Our assessment is based upon the extent to which we actually received the information and had the necessary communications during the course of our work.

- The clarity of information typically ranges from “poor” (e.g. no ability to ascertain the performance drivers of the business) to “good” (e.g. there is a substantial amount of robust and relevant information that provides meaningful insight about the most significant risks, trends, and issues of the Target). This assessment is based upon our judgement as to how access to management and access to information facilitate our understanding of the Target.

## **Basis of our work**

- Our work was carried out on the basis that the information is reliable, accurate and complete in all material respects. Unless explicitly stated in our report, we did not verify or check the information with respect to accuracy or completeness. Our work constitutes neither an audit in accordance with any set of generally accepted auditing standards nor a review in accordance with a set of generally accepted review standards globally, regionally, or by individual territory. Accordingly, we do not express an opinion or any form of assurance with respect to any financial statements, information regarding the Target, or technical accounting advice included in our report.
- We make no representations regarding the sufficiency of our work either for the purposes for which our report was requested or otherwise. The sufficiency of the work we perform remains the sole responsibility of the addressee of our report as are any decisions with respect to the proposed transaction.

# *Strategy* & Impact

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