



Inland Revenue Department
The Government of the Hong Kong Special Administrative Region
of the People's Republic of China

DEPARTMENTAL INTERPRETATION AND PRACTICE NOTES

NO. 55

**DEDUCTION FOR RESEARCH AND
DEVELOPMENT EXPENDITURE**

These notes are issued for the information of taxpayers and their tax representatives. They contain the Department's interpretation and practices in relation to the law as it stood at the date of publication. Taxpayers are reminded that their right of objection against the assessment and their right of appeal to the Commissioner, the Board of Review or the Court are not affected by the application of these notes.

WONG Kuen-fai
Commissioner of Inland Revenue

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INTRODUCTION

Background

In 1965, section 16B of the Inland Revenue Ordinance (the Ordinance) was enacted to allow expenditure incurred by a person carrying on a trade or business for scientific research related to that trade or business as a deduction. The deduction allowable included capital expenditure on plant or machinery but excluded capital expenditure on land or buildings. In 1998, the section was extended to a person in a profession. At the same time, the definition of scientific research was expanded to include a systematic, investigative or experimental activity for the purposes of any feasibility studies and market research. In 2004, the scope of the deduction was further extended to include expenditure incurred on “research and development” (R&D).

2. To encourage more enterprises to conduct R&D activities in Hong Kong, the Inland Revenue (Amendment) (No. 7) Ordinance 2018 (the 2018 Amendment (No. 7) Ordinance) was enacted on 2 November 2018 (Commencement Date) to provide for enhanced tax deduction for expenditure incurred by enterprises on a qualifying R&D activity. Under the 2018 Amendment (No. 7) Ordinance, enterprises will be able to enjoy additional tax deduction for expenditure incurred on domestic R&D. The first \$2 million spent on a qualifying R&D activity will enjoy a 300% deduction and expenditure beyond that will enjoy a 200% deduction. There is no cap on the amount of enhanced tax deduction. The purpose of this Practice Note is to set out in detail the Department’s views and practice on the tax deduction for R&D expenditure.

The 2018 Amendment (No. 7) Ordinance

3. The main provisions of the 2018 Amendment (No. 7) Ordinance are as follows:

Tax deduction for R&D expenditure

- (a) Section 16B, which has replaced the old provisions, generally provides for:

- (i) the deduction for expenditure on an R&D activity; and
 - (ii) the treatment of the proceeds of sale of plant or machinery for, and rights generated from, an R&D activity as trading receipts.
- (b) Part 1 of Schedule 45 (which contains 12 sections) provides for the definitions of the key terms and expressions used throughout the Schedule. Those terms and expressions include:
 - (i) designated local research institution;
 - (ii) qualifying expenditure related to trade, profession or business;
 - (iii) qualifying R&D activity;
 - (iv) R&D activity;
 - (v) R&D expenditure;
 - (vi) Type A expenditure; and
 - (vii) Type B expenditure.
- (c) Part 2 of Schedule 45 contains 3 sections (sections 13, 14 and 15):
 - (i) Section 13 provides for the calculation of the total amount allowed to be deducted under section 16B for R&D expenditure incurred during the basis period for a year of assessment. Generally speaking, a Type A expenditure qualifies for the basic 100% tax deduction, whereas a Type B expenditure qualifies for the enhanced two-tiered tax deduction.

- (ii) Section 14 provides for safeguards to prevent the abuse of tax deduction in respect of an R&D activity. It is more comprehensive than the safeguards in the provisions replaced.
 - (iii) Section 15 provides that an R&D expenditure may only be deducted for one trade, profession or business, which is the same as the provisions replaced.
- (d) Part 3 of Schedule 45 consists of 2 sections (sections 16 and 17):
 - (i) Section 16 provides for the treatment of the proceeds of sale of plant or machinery as trading receipts. It is substantially the same as the provisions replaced.
 - (ii) Section 17 provides for the treatment of the proceeds of sale of rights as trading receipts. It is a rewrite of the old provisions to revise the formula for calculating the amount of the proceeds to be treated as trading receipts after the introduction of the enhanced tax deduction.
- (e) Part 4 of Schedule 45, which contains 2 sections (sections 18 and 19), deals with miscellaneous matters:
 - (i) Section 18 empowers the Commissioner of Inland Revenue (the Commissioner) to seek advice from the Commissioner for Innovation and Technology (Commissioner for I&T) on certain matters related to claims and applications made in relation to section 16B.
 - (ii) Section 19 provides for the powers of the Commissioner for I&T in relation to the designation of local institutions as designated local research institutions.

- (f) Part 5 of Schedule 45 provides for a transitional provision required as a result of the rewrite of section 16B.

Deemed trading receipts if related R&D expenditure is tax deductible

- (g) Section 15(1)(bc) is added to make it clear that the following sums are trading receipts chargeable to profits tax:
- (i) sums received by or accrued to a person for the use, or the right to the use, outside Hong Kong of any intellectual property or know-how generated from any R&D activity (in respect of which deduction is allowable under section 16B) in ascertaining profits of the person under Part 4 of the Ordinance; and
 - (ii) sums received by or accrued to a person for imparting or undertaking to impart knowledge directly or indirectly connected with the use outside Hong Kong of any such property or know-how.

DEDUCTION FOR R&D EXPENDITURE

Deduction under section 16B

4. Despite that an expenditure on an R&D activity is generally capital in nature, section 16B allows tax deduction for such expenditure incurred by a person if it is not allowable as a deduction under other provisions of the Ordinance. The total amount of deduction that can be allowed is to be determined in accordance with Schedule 45 to the Ordinance.

5. R&D expenditures eligible for deduction under section 16B are classified into either “Type A expenditure” which qualifies for 100% deduction or “Type B expenditure” which qualifies for the enhanced tax deduction. The enhanced tax deduction for Type B expenditure is a two-tiered deduction regime. The deduction is 300% for the first \$2 million of the aggregate amount of Type B expenditure, and 200% for the remaining

amount. The rates of enhanced tax deduction would apply uniformly across all enterprises regardless of their scale.

R&D ACTIVITY

Meaning of “R&D activity”

6. The term “R&D activity” is defined in section 2 of Schedule 45. The definition reads as follows:

“An R&D activity is –

- (a) an activity in the fields of natural or applied science to extend knowledge;
- (b) a systematic, investigative or experimental activity carried on for the purposes of any feasibility study or in relation to any market, business or management research;
- (c) an original and planned investigation carried on with the prospect of gaining new scientific or technical knowledge and understanding; or
- (d) the application of research findings or other knowledge to a plan or design for producing or introducing new or substantially improved materials, devices, products, processes, systems or services before they are commercially produced or used.”

7. The above definition is no different from that for “research and development” under the pre-amended Ordinance (i.e. the Ordinance as in force immediately before the Commencement Date), which has a very wide scope. “R&D activity” thus embraces all the activities that are referred to as scientific research (i.e. the application of new scientific principles in an existing area of research, or the application of existing principles in a new area of research). In addition, it includes original and planned investigations into new scientific or technical knowledge and understanding, as well as the

application of any existing research findings or knowledge to a plan or design for production or introduction of new or substantially improved materials, devices, products, processes, systems or services prior to the commencement of their commercial production or use. These activities are in line with those that are regarded as “research” and “development” in the Hong Kong Accounting Standard 38. Further, a systematic, investigative or experimental activity carried on for the purposes of any feasibility study or in relation to any market, business or management research, though non-scientific or non-technological, is also covered.

8. “R&D activity” can therefore be described as an activity working for tomorrow to develop new products, new lines and improvements to present production. It does not, however, cover “quality control” which is more aptly described as working for today and today’s production to ensure that what has been produced is up to standard. Deductibility of expenses relating to quality control activities should be tested under the normal rules for deduction under sections 16(1) and 17 of the Ordinance (i.e. the expenses are deductible if they are incurred in the production of chargeable profits of the taxpayer and that they are not capital in nature). Similarly, the following activities are not R&D activities:

- (a) routine testing of materials, devices, products, processes, systems or services;
- (b) routine data collection;
- (c) routine, cosmetic or stylistic modifications or changes to materials, devices, products, processes, systems or services;
- (d) market survey for the purpose of ascertaining the needs of customers where no systematic, investigative or experimental activity is involved; and
- (e) production and distribution of goods and services.

9. The phrase “substantially improved” means to change or adapt the scientific or technological characteristics of something to the point where it is “better” than the original. It has a reasonably high threshold. The

improvement should be more than a minor or routine upgrading, and should represent something that would generally be acknowledged by a competent professional working in the field as a genuine and non-trivial improvement. Improvements arising from the adaptation of knowledge or capability from another field of science or technology are regarded as substantial if they would generally be acknowledged by a competent professional working in the field as a genuine and non-trivial improvement. Mere adaptation of an existing product or process to a particular customer's need would unlikely be substantial improvement. The question of what scale of advance would constitute a substantial improvement will differ between fields of science and technology and will depend on what a competent professional working in the field would regard as a genuine and non-trivial improvement.

QUALIFYING R&D ACTIVITY

Meaning of “qualifying R&D activity”

10. The objectives of the enhanced tax deduction are to encourage enterprises to invest more in R&D in Hong Kong, promote local R&D activities and groom local R&D talents. As such, regardless of whether the R&D activity is out-sourced to a designated local research institution or carried out by the enterprise itself, only the R&D activity carried out in Hong Kong would be treated as a qualifying R&D activity eligible for enhanced tax deduction. For the R&D activity conducted outside Hong Kong, it may still be eligible for the existing 100% tax deduction. Section 4(1) of Schedule 45 provides the following definition:

“A qualifying R&D activity is an R&D activity that –

- (a) falls within the description in section 2(a), (c) or (d) of this Schedule; and
- (b) is wholly undertaken and carried on in Hong Kong.”

11. The definition of “qualifying R&D activity” is primarily built on the definition of “R&D activity”. However, “qualifying R&D activity” is not intended to cover activities for the purposes of any feasibility study or in

relation to any market, business or management research, which are generally not regarded as research and development in most jurisdictions that provide enhanced tax deduction. Further, the R&D enhanced tax incentive is to promote activities that seek to achieve scientific or technological advancement and involve the resolution of some scientific or technological uncertainties. Certain activities are not included in the definition of “qualifying R&D activity”. Section 4(2) of Schedule 45 reads as follows:

“A qualifying R&D activity does not include –

- (a) any efficiency survey, feasibility study, management study, market research or sales promotion;
- (b) the application of any publicly available research findings or other knowledge to a plan or design, **with an anticipated outcome and without any scientific or technological uncertainty**;
- (c) an activity that does **not seek to directly contribute to achieving an advance in science or technology by resolving scientific or technological uncertainty**; or
- (d) any work to develop the **non-scientific or non-technological aspect** of a new or substantially improved material, device, product, process, system or service.”

12. The exclusions are made with due regard to those adopted in other tax jurisdictions with similar tax incentives (e.g. the United Kingdom).

13. The scope of “qualifying R&D activity” indicates that a qualifying R&D activity takes place when a project seeks to achieve an advance in science or technology. Any activity which does not directly contribute to achieving this advance in science or technology through the resolution of scientific or technological uncertainty is not a qualifying R&D activity.

14. The requirement “wholly undertaken and carried on in Hong Kong” in section 4(1)(b) of Schedule 45 does not mean that the whole of an R&D

project must be carried on in Hong Kong. An R&D project often consists of a number of activities conducted to a method or plan in order to achieve an advance in science or technology. Though some of the activities may be carried on outside Hong Kong, enhanced deduction can be claimed for the R&D expenditures incurred on those activities carried on in Hong Kong provided that they fall within the meaning of “qualifying R&D activity”.

Boundaries of an R&D project

15. It is important to get the boundaries of an R&D project correct. In relation to a qualifying R&D activity, an R&D project should encompass all the activities which collectively serve to resolve the scientific or technological uncertainty associated with achieving advance in science or technology. So it could include a number of different sub-projects. A project may itself be part of a larger commercial project, but that does not make the parts of the commercial project that do not address scientific or technological uncertainty into a qualifying R&D activity.

Advance in science or technology

16. An advance in science or technology means an advance in overall knowledge or capability in a field of science or technology (not a company’s own state of knowledge or capability alone). This includes the adaptation of knowledge or capability from another field of science or technology in order to make such an advance where this adaptation was not readily deducible. An advance in science or technology may have tangible consequences (e.g. a new or more efficient product, or a process which generates less pollution) or more intangible outcomes (e.g. new knowledge or cost improvements). A material, device, product, process, system, service or source of knowledge does not become an advance in science or technology simply because science or technology is used in its creation. Work which uses science or technology but which does not advance scientific or technological capability as a whole is not an advance in science or technology.

17. Science is the systematic study of the nature and behaviour of the physical and material universe. Work in the arts, humanities and social sciences, including economics, is not science for the purposes of enhanced tax deduction. Mathematical techniques are frequently used in science, but

mathematical advances in and of themselves are not science unless they are advances in representing the nature and behaviour of the physical and material universe. Technology is the practical application of scientific principles and knowledge, where “scientific” is based on the aforesaid definition of science.

18. Overall knowledge or capability in a field of science or technology means the knowledge or capability in the field which is publicly available or is readily deducible from the publicly available knowledge or capability by a competent professional working in the field. Work which seeks an advance relative to this overall knowledge or capability is a qualifying R&D activity. Overall knowledge or capability in a field of science or technology can still be advanced in situations where several companies are working at the cutting edge in the same field, and are doing similar work independently.

19. Even if the advance in science or technology sought by a project is not achieved or not fully realised, a qualifying R&D activity still takes place. If a particular advance in science or technology has already been made or attempted but details are not readily available (e.g. it is a trade secret), work to achieve such an advance can still be an advance in science or technology. However, the routine analysis, copying or adaptation of an existing material, device, product, process, system or service will not be an advance in science or technology, even though it may be completely new to the company or the company’s trade.

20. Therefore, a project which seeks to achieve, for example, the following is a qualifying R&D activity:

- (a) extend overall knowledge or capability in a field of science or technology;
- (b) create a material, device, product, process, system or service which incorporates or represents an increase in overall knowledge or capability in a field of science or technology;
- (c) make a substantial improvement to an existing material, device, product, process, system or service through scientific or technological changes; or

- (d) use science or technology to duplicate the effect of an existing material, device, product, process, system or service in a new or substantially improved way (e.g. a product which has exactly the same performance characteristics as existing models, but is built in a fundamentally different manner).

Example 1

Enterprise HK-1 and Enterprise HK-2 were not associated. They carried out R&D activities to develop a new biometric authentication technology unknown in the market. Their projects were similar. Enterprise HK-1 succeeded in achieving a technological breakthrough much earlier.

Two different R&D projects carried out respectively by Enterprise HK-1 and Enterprise HK-2 were qualifying R&D activities. These projects sought to contribute directly to achieving an advance in science or technology. Enterprise HK-1 and Enterprise HK-2 would be eligible for enhanced tax deduction in respect of the R&D expenditures incurred if other conditions were satisfied.

Scientific or technological uncertainty

21. Scientific or technological uncertainty exists when knowledge of whether something is scientifically possible or technologically feasible, or how to achieve it in practice, is not readily available or deducible by a competent professional working in the field. This includes system uncertainty. Scientific or technological uncertainty will often arise from turning something that has already been established as scientifically feasible into a cost-effective, reliable and reproducible material, device, product, process, system or service. Uncertainties that can readily be resolved by a competent professional working in the field are not scientific or technological uncertainties. Similarly, improvements, optimisations and fine-tuning which do not materially affect the underlying science or technology do not constitute work to resolve scientific or technological uncertainty.

22. System uncertainty is scientific or technological uncertainty that results from the complexity of a system rather than uncertainty about how its

individual components behave. For example, in electronic devices, the characteristics of individual components or chips are fixed, but there can still be uncertainty about the best way to combine those components to achieve an overall effect. However, assembling a number of components (or software sub-programs) to an established pattern, or following routine methods for doing so, involves little or no scientific or technological uncertainty. Similarly, work on combining standard technologies, devices, and/or processes can involve scientific or technological uncertainty even if the principles for their integration are well known. There will be scientific or technological uncertainty if a competent professional working in the field cannot readily deduce how the separate components or sub-systems should be combined to have the intended function.

Directly contribute

23. To directly contribute to achieving an advance in science or technology, an activity (or several activities in combination) must attempt to resolve an element of the scientific or technological uncertainty associated with achieving the advance. Activities which directly contribute to achieving an advance in science or technology by resolving scientific or technological uncertainty include:

- (a) activities to create or adapt software, materials or equipment needed to resolve the scientific or technological uncertainty, provided that the software, material or equipment is created or adapted solely for use in a qualifying R&D activity;
- (b) scientific or technological planning activities; and
- (c) scientific or technological design, testing and analysis undertaken to resolve the scientific or technological uncertainty.

24. Activities which do not directly contribute to the resolution of scientific or technological uncertainty include:

- (a) the range of commercial and financial steps necessary for innovation and for the successful development and

marketing of a new or substantially improved material, device, product, process, system or service;

- (b) work to develop non-scientific or non-technological aspects of a new or substantially improved material, device, product, process, system or service;
- (c) the production and distribution of goods and services;
- (d) administration and other supporting services; and
- (e) general support services (such as transportation, storage, cleaning, repair, maintenance and security).

Cosmetic and aesthetic effects

25. Cosmetic and aesthetic qualities are not of themselves science or technology, and so work to improve the cosmetic or aesthetic appeal (i.e. non-scientific or non-technological aspect) of a material, device, product, process, system or service would not in itself be a qualifying R&D activity under section 4(2)(d) of Schedule 45 or even an R&D activity under section 2 of that schedule. However, work to create a desired cosmetic or aesthetic effect through the application of science or technology can require a scientific or technological advance, and resolving the scientific or technological uncertainty associated with such a project would therefore be a qualifying R&D activity.

Other specific issues on qualifying R&D activities

Start and end of an R&D project

26. In relation to a qualifying R&D activity, the R&D project begins when work to resolve the scientific or technological uncertainty starts, and ends when that uncertainty is resolved or work to resolve it ceases. This means that work to identify the requirements for the material, device, product, process, system or service, where no scientific or technological questions are at issue, is not a qualifying R&D activity. An R&D project ends when knowledge is codified in a form usable by a competent professional working

in the field, or when a prototype or pilot plant with all the functional characteristics of the final material, device, product, process, system or service is produced. All the activities from the start of the R&D project up to its end are qualifying R&D activities if they are carried on in Hong Kong.

27. Although an R&D project for a material, device, product, process, system or service may have ended, new problems which involve scientific or technological uncertainty may emerge after it has been turned over to production or put into use. The resolution of these problems may require a new qualifying R&D activity to be carried out. But there is a distinction between such problems and routine fault fixing. The latter is not a qualifying R&D activity, nor is it an R&D activity.

Planning as part of an R&D project

28. Scientific or technological planning activities associated with a project directly contribute to resolving the scientific or technological uncertainty associated with the project, and are therefore qualifying R&D activities. These include defining scientific or technological objectives, assessing scientific or technological feasibility, identifying particular scientific or technological uncertainties, estimating development time, schedule, and resources of the R&D project, and high-level outlining of the scientific or technical work, as well as the detailed planning and management of the work.

29. Elements of an enterprise's planning activities relating to an R&D project but not directly contributing to the resolution of scientific or technological uncertainty, such as identifying or researching market niches in which the R&D project might benefit an enterprise, or examination of a project's financial, marketing, and legal aspects, fall outside the category of scientific or technological planning, and do not constitute any qualifying R&D activity. They are not R&D activities, either.

Abortive projects

30. Not all projects succeed in their aims. Registration of patents is not a prerequisite for an activity to be regarded as an R&D activity. What counts is whether there is an intention to achieve an advance in science or

technology, not whether ultimately the associated scientific or technological uncertainty is completely resolved, or resolved to the degree intended. Scientific or technological planning activities associated with projects which are not taken forward (e.g. because of insurmountable technical or commercial challenges) are still qualifying R&D activities. The same rationale also applies to R&D activities.

Prototypes and pilot plants

31. A prototype is an original model on which something new or substantially improved is patterned, and of which all things of the same type are representations or copies. It is a basic experimental model possessing the essential characteristics of the intended material, device, product, process, system or service. The design, construction, and testing of prototypes generally fall within the scope of R&D activities or qualifying R&D activities for tax purposes. But once any modifications necessary to reflect the test findings have been made to the prototypes, and further testing has been satisfactorily completed, the scientific or technological uncertainty has been resolved and further work will not be a qualifying R&D activity. Similarly, the construction and operation of pilot plants while assessing their operations is a qualifying R&D activity until the scientific or technological uncertainty associated with the intended advance in science or technology has been resolved.

Design

32. When achieving design objectives requires the resolution of scientific or technological uncertainty within a project, work to do this will be a qualifying R&D activity. Design activities which do not directly contribute to the resolution of scientific or technological uncertainty within a project are not qualifying R&D activities.

Content delivered through science or technology

33. Information or other content which is delivered through a scientific or technological medium is not of itself science or technology. However, improvements in scientific or technological means to create, manipulate and transfer information or other content can be scientific or technological

advances, and resolving the scientific or technological uncertainty associated with such projects would therefore be a qualifying R&D activity.

Equal applicability in any branch or field of science or technology

34. The enhanced tax deduction can benefit all sectors including the financial industry. Work in software engineering, for example, is subject to the same fundamental criteria for being a qualifying R&D activity as work in textile science, or nanotechnology, or anything else. This equality also applies to the methods used to resolve scientific or technological uncertainty. For example, it is sometimes possible to implement functionality in a product or process by means of software or of hardware. As long as the scientific or technological uncertainty cannot readily be resolved by a competent professional working in the field, hardware and software methods are both equally qualifying R&D activities in these circumstances.

JUDICIAL GUIDANCE

Meaning of R&D

35. There is guidance on the meaning of R&D for tax purposes in *BE Studios Ltd v Smith & Williamson Ltd* [2006] STC 358. BE Studios had a project to produce new software. Mr. Justice Evans-Lombe accepted that it was not sufficient that the claimant's products were innovative or cutting edge for them to be R&D within the meaning of the statute. The fundamental test was whether the software work sought to achieve a scientific or technological advance, and formed the whole or part of a project to resolve scientific or technological uncertainty on a systematic basis.

36. On the subject of computer games, Mr. Justice Evans-Lombe indicated that there were a number of stages in the production of a computer game. These involved conception or acquisition of the ideas for the game, planning, script-writing, drawing and designing backgrounds and characters, creating animated sequences and soundtrack and programming the result of these. He said, "none of these activities without more necessarily involve qualifying R&D".

37. Mr. Justice Evans-Lombe was presented with an extensive description of the company's objectives in terms of new functionality and computer environments, but said that this nowhere described any new scientific or technological knowledge. He found that there was no evidence presented that supported the claim that R&D within the BIS Guidelines (i.e. Guidelines issued by the UK Secretary of State for Trade and Industry on section 837A of the Income and Corporation Taxes Act 1988) had been carried out.

SEEKING ADVICE FROM COMMISSIONER FOR I&T

Consultation with Commissioner for I&T

38. Since the Department may not have sufficient knowledge in the areas of science and technology, section 18 of Schedule 45 provides that the Commissioner may seek advice from the Commissioner for I&T, or a public officer authorised by the Commissioner for I&T, in order to ascertain the following upon receiving a claim or an application for an advance ruling in relation to a deduction under section 16B:

- (a) whether an activity constitutes an R&D activity or a qualifying R&D activity; and
- (b) whether an R&D expenditure was incurred, or is to be incurred, by the claimant or applicant in relation to an R&D activity or a qualifying R&D activity.

39. For the purpose of seeking advice from the Commissioner for I&T, the secrecy provision in section 4 of the Ordinance has been amended to allow the Commissioner to pass information or documents to the Commissioner for I&T, or a public officer authorised by the Commissioner for I&T. While the Commissioner may not be required to consult Innovation and Technology Commission in every case, advice will be sought from the Commissioner for I&T if there are doubts as to the nature of the R&D activity or the R&D expenditure.

R&D EXPENDITURE

Meaning of “R&D expenditure”

40. “R&D expenditure” may be either in the form of a payment to an R&D institution or an expenditure on an in-house R&D activity undertaken by a person. Under section 6(1) of Schedule 45, an R&D expenditure, in relation to a trade, profession or business in respect of which a person is chargeable to profits tax, is:

- (a) a payment to an R&D institution for an R&D activity related to the trade, profession or business;
- (b) a payment to an R&D institution which has, as an object, the undertaking of an R&D activity related to the class of trade, profession or business to which the trade, profession or business belongs, where the payment is used for pursuing that object; or
- (c) any other expenditure on an R&D activity related to the trade, profession or business, including capital expenditure except to the extent that it is expenditure on land or buildings or on alterations, additions or extensions to buildings.

41. It is specifically provided in section 6(2) and (4)(b) of Schedule 45 that R&D expenditure does not include payments or expenditures for acquiring rights generated from an R&D activity. If the rights acquired are patented rights, the expenditure can amount to an allowable deduction under section 16E of the Ordinance.

42. For an in-house R&D activity, R&D expenditure would include any expenditure for carrying out, and providing facilities for carrying out, an R&D activity. Thus, capital expenditure on plant or machinery purchased for an R&D activity related to a taxpayer’s trade, profession or business is allowable in full as a deduction for the basis period during which it was incurred. If the expenditure is incurred before the trade commences, it should be treated as incurred in the first basis period.

43. No deduction is allowable under section 16B in respect of any capital expenditure incurred on land or buildings or on alterations, additions or extensions to buildings. If such expenditure results in a relevant interest in a building, industrial building allowances under section 34 of the Ordinance can be granted on the capital expenditure on a building used for an R&D activity, irrespective of the nature of trade. See the definition of industrial building or structure in section 40 of the Ordinance.

44. The term “R&D institution” is defined in section 6(5) of Schedule 45 as a designated local research institution, or a university or college that is not a designated local research institution. Under section 19 of Schedule 45, the Commissioner for I&T may designate any of the following institutions as a designated local research institution:

- (a) any university or college located in Hong Kong;
- (b) any other institute, association, organisation or corporation located in Hong Kong that undertakes qualifying R&D activities in Hong Kong.

45. R&D service providers which provide R&D services in Hong Kong and are competent to provide such services may apply to Innovation and Technology Commission for designation as designated local research institutions. A designation made under section 19 of Schedule 45 takes effect on the date specified in the instrument of designation, and can be revoked by the Commissioner for I&T at any time. A list of designated local research institutions can be found at the website of Innovation and Technology Commission (www.itc.gov.hk/en/dlri/index.htm). While designated local research institutions would not include universities or colleges located outside Hong Kong, such universities or colleges could be accepted as R&D institutions. Therefore, payments made to overseas universities or colleges for an R&D activity related to a trade, profession or business, which qualify as R&D expenditure, would be eligible for 100% tax deduction. This preserves the position for deduction of R&D expenditures prior to the enactment of the 2018 Amendment (No. 7) Ordinance.

When R&D expenditure is incurred

46. Section 7(1) of Schedule 45 provides that an R&D expenditure is incurred by a person:

- (a) for a payment made to an R&D institution – at the time the payment is made by the person; or
- (b) for an in-house R&D expenditure – at the time the expenditure is incurred by the person.

47. However, for a person who is about to carry on a trade, profession or business, the R&D expenditure is treated as if it had been incurred on the first day on which the person carries on the trade, profession or business under section 7(2) of Schedule 45.

Meaning of “Type A expenditure”

48. “Type A expenditure” is defined in section 8 of Schedule 45. A Type A expenditure, in relation to a trade, profession or business in respect of which a person is chargeable to profits tax, is:

- (a) for a payment made, or other expenditure incurred, on or after the Commencement Date – an R&D expenditure other than a Type B expenditure; or
- (b) for a payment made, or other expenditure incurred, during the period beginning on 1 April 2018 and ending immediately before the Commencement Date (i.e. the specified period) – an interim Type A expenditure.

49. “Interim Type A expenditure” is defined in section 9 of Schedule 45 as:

- (a) a payment made during the specified period that:
 - (i) would have been deductible under section 16B(1)(a) of the pre-amended Ordinance; and

- (ii) would not be a Type B expenditure within the meaning of section 10(1)(a) of Schedule 45 deductible under section 16B of the amended Ordinance (i.e. the Ordinance as amended by the 2018 Amendment (No. 7) Ordinance) if, on the date of payment, that Ordinance were in force;
- (b) a payment that:
- (i) is made during the specified period to a university, college, institute, association, organisation or corporation (entity) that is, on the Commencement Date, a designated local research institution;
 - (ii) would not have been deductible under section 16B(1)(a) of the pre-amended Ordinance; and
 - (iii) would be a Type A expenditure within the meaning of section 8(a) of Schedule 45 deductible under section 16B of the amended Ordinance if, on the date of payment, that Ordinance were in force and the entity were a designated local research institution;
- (c) any other expenditure (specified expenditure) incurred during the specified period that:
- (i) would have been deductible under section 16B(1)(b) of the pre-amended Ordinance; and
 - (ii) would not be a Type B expenditure within the meaning of section 10(1)(a) of Schedule 45 deductible under section 16B of the amended Ordinance if, on the date on which the specified expenditure is incurred, that Ordinance were in force.

50. Thus, payments made to an R&D institution and in-house expenditures incurred for an R&D activity during the specified period, that would not be a Type B expenditure but would have been deductible under

section 16B of the pre-amended Ordinance, continue to be deductible as an interim Type A expenditure. Besides, payments made during the specified period to an institution that was not an approved research institute under section 16B(4)(a) of the pre-amended Ordinance at the time of payment but would become a designated local research institution on the Commencement Date are also deductible as an interim Type A expenditure provided that the conditions set out in section 14 of Schedule 45 are satisfied (e.g. vesting requirement imposed under section 14(a)(i) of Schedule 45). For an R&D expenditure incurred on or after the Commencement Date, the expenditure not falling within the meaning of “Type B expenditure” is a Type A expenditure eligible for 100% deduction, subject to the same conditions under section 14 of Schedule 45.

Meaning of “Type B expenditure”

51. “Type B expenditure” is defined in section 10(1) of Schedule 45. A Type B expenditure, in relation to a trade, profession or business in respect of which a person is chargeable to profits tax, is:

- (a) for a payment made, or other expenditure incurred, on or after the Commencement Date – an R&D expenditure falling within any of the following descriptions:
 - (i) a payment to a designated local research institution for a qualifying R&D activity related to the trade, profession or business;
 - (ii) a payment to a designated local research institution which has, as an object, the undertaking of a qualifying R&D activity related to the class of trade, profession or business to which the trade, profession or business belongs, where the payment is used for pursuing that object;
 - (iii) a qualifying expenditure related to the trade, profession or business; or

- (b) for a payment made, or other expenditure incurred, during the specified period – an interim Type B expenditure.

52. Under section 11 of Schedule 45, an interim Type B expenditure is:

- (a) a payment that:
 - (i) is made during the specified period to a university, college, institute, association, organisation or corporation (entity) that is, on the Commencement Date, a designated local research institution; and
 - (ii) would be a Type B expenditure within the meaning of section 10(1)(a) of Schedule 45 deductible under section 16B of the amended Ordinance if, on the date of payment, that Ordinance were in force and the entity were a designated local research institution;
- (b) any other expenditure (specified expenditure) incurred during the specified period that:
 - (i) would have been deductible under section 16B(1)(b) of the pre-amended Ordinance; and
 - (ii) would be a Type B expenditure within the meaning of section 10(1)(a) of Schedule 45 deductible under section 16B of the amended Ordinance if, on the date on which the specified expenditure is incurred, that Ordinance were in force.

53. The combined effect of sections 10 and 11 of Schedule 45 is that as from 1 April 2018, payments made to a designated local research institution and in-house qualifying expenditures for a qualifying R&D activity are Type B expenditures eligible for enhanced tax deduction if other conditions under section 14 of Schedule 45 are satisfied. Enhanced tax deduction would also be available for payments made to a prospective designated local research institution during the specified period even though the institution would only be designated by the Commissioner for I&T on the Commencement Date.

Retrospective deduction claim for outsourced R&D activity

54. In order to allow taxpayers to claim back 100% deduction or enhanced deduction for payments on R&D activities outsourced to an institution prior to its becoming a designated local research institution, sections 6(3) and 10(2) of Schedule 45 provide that a payment to a local institution:

- (a) that is not a university or college; and
- (b) that is not, and never has been, a designated local research institution,

is a payment to an R&D institution or a designated local research institution if the local institution is designated as a designated local research institution within 6 months after the date of payment. If the local institution only becomes a designated local research institution in the year of assessment following the year of payment, a claim can be made for the payment even though the relevant assessment might have become final and conclusive.

RELATED TO TRADE, PROFESSION OR BUSINESS

Meaning of “related to trade, profession or business”

55. Sections 3 and 5 of Schedule 45 define what are meant by an R&D activity and a qualifying R&D activity related to a trade, profession or business; or a class of trade, profession or business respectively. An R&D activity related to a trade, profession or business; or a class of trade, profession or business includes:

- (a) an R&D activity that may lead to or facilitate an extension, or an improvement in the technical efficiency, of the trade, profession or business; or the class of trade, profession or business; and

- (b) an R&D activity of a medical nature that is of particular relevance to the welfare of employees employed in the trade, profession or business; or the class of trade, profession or business.

56. A qualifying R&D activity related to a trade, profession or business; or a class of trade, profession or business includes:

- (a) a qualifying R&D activity that may lead to or facilitate an extension, or an improvement in the technical efficiency, of the trade, profession or business; or the class of trade, profession or business; and
- (b) a qualifying R&D activity of a medical nature that is of particular relevance to the welfare of employees employed in the trade, profession or business; or the class of trade, profession or business.

57. To qualify for deduction under section 16B, the R&D activity or the qualifying R&D activity must be related to the enterprise's trade, profession or business or the class of trade, profession or business to which the enterprise's trade, profession or business belongs. An R&D activity or a qualifying R&D activity undertaken by an enterprise with the object of branching out into a new line of business or of improving the technical efficiency of its existing business will be treated as related to the trade; also expenditure by an enterprise for research into an occupational disease peculiar to the industry would be treated as related to the enterprise's trade.

58. In *Salt v Golding* [1996] STC (SCD) 269, the question was what scientific research related to the trade the taxpayer had undertaken. It was ruled that the taxpayer's research could not be related to his publication of a lecture given by another person. Merely using the computing and video equipment for printing the lecture was not research. All the taxpayer's research in the year was attributable to his profession as an author. His research was not related to the trade of publishing books written by third parties, nor was it such as might "lead to or facilitate an extension of that trade" within the definition of "scientific research". Accordingly, the taxpayer's appeal was dismissed.

Payments to R&D institutions

59. Payments to R&D institutions including designated local research institutions are eligible for tax deduction under section 16B if the payments are for a specific R&D activity or qualifying R&D activity related to the enterprise's trade, profession or business, or for general research if one of the objects of the institution is the undertaking of an R&D activity or a qualifying R&D activity related to the class of trade, profession or business to which the enterprise's trade, profession or business belongs, where the payments are used for pursuing that object.

60. The deduction is allowed irrespective of the actual usage of the funds by the R&D institutions for either capital or revenue purposes. Thus, payments for establishing or extending an R&D institution, payments towards the administration of the R&D institution and payments for the actual carrying out of the R&D activity or qualifying R&D activity are deductible under section 16B as long as the funds are used for pursuing the R&D institution's object of undertaking an R&D activity or a qualifying R&D activity related to the class of trade, profession or business to which the enterprise's trade, profession or business belongs.

61. Payments made to R&D institutions under section 16B should be distinguished from donations made to them. While the former must be made for an R&D activity or a qualifying R&D activity related to the enterprise's trade or the class of trade to which the enterprise's trade belongs, the latter need not be made for any specific purpose or related to the enterprise's trade. Donations to R&D institutions may be deducted under section 16D of the Ordinance if the R&D institutions are also tax-exempt charities.

62. It should, however, be noted that any payment made to a designated local research institution for an R&D activity carried on outside Hong Kong can only rank for 100% tax deduction as Type A expenditure. Therefore, if an enterprise contracts out an R&D project to a designated local research institution which further subcontracts part of the project to a research institution outside Hong Kong, only that part of the payment that is paid for the qualifying R&D activities carried on in Hong Kong is eligible for enhanced deduction as Type B expenditure.

QUALIFYING EXPENDITURE

Meaning of “qualifying expenditure related to trade, profession or business”

63. According to the empirical studies of European Union and the United States, the major components of R&D expenditure are labour (60% to 70%), consumables (15%) and contract research expenses (15%). These three components commonly found in most jurisdictions provide a useful pointer as to what should be the target expenditure of the two-tiered enhanced tax deduction regime. Section 12(1) of Schedule 45 defines “qualifying expenditure related to trade, profession or business”, which would be a Type B expenditure, as:

- (a) an expenditure in relation to an employee who is engaged directly and actively in a qualifying R&D activity related to the trade, profession or business; or
- (b) an expenditure on a consumable item that is used directly in a qualifying R&D activity related to the trade, profession or business.

Staffing costs

64. Under section 12(5) of Schedule 45, “expenditure in relation to an employee”:

- (a) means any salary, wages or any of the following items, paid or granted (whether in cash or any other form), to or in respect of an employee in relation to the employment:
 - (i) an ordinary annual contribution to a fund duly established under a recognised occupational retirement scheme;
 - (ii) an ordinary annual premium in respect of a contract of insurance under a recognised occupational retirement scheme;

- (iii) any contributions made to a mandatory provident fund scheme at regular intervals that are either of similar or substantially similar amounts or of amounts calculated by reference to a scale or a fixed percentage of the employee's salary or other remuneration;
 - (iv) any other benefit that constitutes a cash outlay paid by the employer; and
- (b) does not include any remuneration of a director, or any item that falls within the description in paragraph (a)(i), (ii), (iii) or (iv) paid or granted (whether in cash or any other form) to or in respect of a director.

65. Staffing costs on employees engaged directly and actively in a qualifying R&D activity can be a qualifying expenditure. Where only a proportion of an employee's work constitutes direct and active engagement in a qualifying R&D activity, then only that proportion of the staffing costs can qualify. Whether an employee is directly and actively engaged in a qualifying R&D activity, and the extent of such engagement, is a question of fact based on the duties performed and not on the job title.

66. If staff is only involved in a qualifying R&D activity for part of their time, an apportionment method must be used to separate out eligible and ineligible expenditure. Where apportionment has been used, it must be supported by an audit trail of source documents and working papers, and capable of being substantiated (e.g. through timesheets kept). The records should clearly show how the company has apportioned expenses.

67. Persons not themselves directly and actively engaged in a qualifying R&D activity, but supporting others who are, are not regarded as being directly engaged in the qualifying R&D activity. In this connection, section 12(4)(a) of Schedule 45 stipulates that a person is not engaged directly and actively in a qualifying R&D activity related to a trade, profession or business only because the person provides, in support of the activity, services such as:

- (a) any accounting service;

(b) any administrative service; or

(c) any secretarial service.

Thus, the staffing costs in respect of the supporting activities undertaken by the enterprise outside the R&D project itself are not included as qualifying expenditure.

Example 2

Employee-R headed a research team in an enterprise working on a qualifying R&D activity. While he worked full time on the qualifying R&D activity, he spent time to manage the research team. He also carried out various scientific studies and maintained the laboratory and the equipment inside in good working condition.

Strictly, Employee-R cannot be regarded as engaged directly and actively in the qualifying R&D activity when he was managing the research team. If the time involved in management work was not significant, the Commissioner would be prepared to accept the full payroll costs spent on Employee-R as a qualifying expenditure eligible for enhanced tax deduction. However, the payroll costs in relation to the maintenance work carried out by the maintenance department (e.g. repairing the laboratory equipment) were not a qualifying expenditure. Similarly, payroll costs of the human resources department and the finance department allocated to the R&D project cannot qualify for enhanced tax deduction.

68. Where an individual has a contract of employment with an enterprise, he can generally be accepted as an employee of the enterprise. If a group entity is recharged for the use of services provided by employees of another group entity, the recharge is not the enterprise's own staffing cost. On the other hand, if a group has one entity operating the payrolls for all of the entities in the group, it does not necessarily mean that all the employees are the staff of the group entity operating the payrolls. Whether an individual is an employee of an enterprise is a question of fact (i.e. whether the employer and employee relationship subsists).

69. To constitute an expenditure in relation to an employee (i.e. a qualifying expenditure), there should be an employer-employee relationship between the enterprise and the employee engaged directly and actively in a qualifying R&D activity. If the staffing costs borne by an enterprise relate to secondees or expatriates sponsored by the enterprise and the secondees or expatriates take instructions from the enterprise, such staffing costs are “expenditure in relation to an employee” under section 12(5) of Schedule 45. Expert consultants under a temporary employment contract with the enterprise and part-time R&D staff are employees of the enterprise and their salaries can qualify for enhanced tax deduction. Nevertheless, fees paid to independent freelancers or staff providers who supply R&D personnel cannot qualify for enhanced tax deduction as freelancers and externally provided personnel are not the enterprise’s employees even though they may be subject to supervision, direction or control by the enterprise as to the manner in which their services are provided. Nor can the payroll costs in respect of an overseas employee who usually works and resides outside Hong Kong qualify for enhanced tax deduction. His R&D work is likely to be carried on outside Hong Kong and is not a qualifying R&D activity. Such payroll costs may be deducted under section 16B as a Type A expenditure.

70. Apart from salaries, wages and retirement benefits set out in section 12(5) of Schedule 45, “expenditure in relation to an employee” also includes any other benefit that constitutes a cash outlay paid by the employer such as staff quarters expenses, medical insurance premiums, etc. It would include training and certification costs in areas of specialisation relevant to a qualifying R&D activity, as well as airfare and living allowances incurred to sponsor an employee to attend relevant overseas training. But stock-based compensation like share options and share awards would be excluded if it does not constitute a cash outlay paid by the employer.

71. Remuneration paid to directors and shadow directors as defined in section 12(5) of Schedule 45 is excluded from the qualifying expenditure. Hence, it is only eligible for 100% deduction as a Type A expenditure. Strictly, enhanced deduction for director’s remuneration is not permitted even though the director may occupy a dual role. In the absence of tax abuses and subject to transfer pricing rules, apportionment can be allowed to address situations where a person occupies a dual role in being both a director and an employee directly and actively engaged in a qualifying R&D activity.

Example 3

Expert-R working in the field of artificial intelligence set up a company with himself being the sole shareholder and director. He directly and actively engaged in the development of a robot, with advanced characteristics of artificial intelligence, for the medical industry. Apart from the director's fee, he also received salaries for his research services provided to the company.

Expert-R clearly had a dual role, as a director and an employee of the company. If the salaries received by him were an arm's-length compensation for his research services provided to the company, the salaries can be regarded as expenditures in relation to an employee qualifying for enhanced deduction.

Consumable items

72. An expenditure incurred on consumable items used directly in a qualifying R&D activity is a qualifying expenditure. The term "consumable item" means any material or item, including any fuel, power and water that, when used, is consumed or transformed in such a way that it is no longer usable in its original form. Software is not within consumable items as it is not consumed or transformed. Further, section 16B(4) prohibits deduction of capital expenditure incurred on computer software under section 16B as such expenditure is deductible under section 16G of the Ordinance.

73. A good example of a consumable item would be a laboratory chemical used in a qualifying R&D activity, which is used up or converted into an unusable product in an R&D process. In this context, the Commissioner would not seek to exclude expenditure on chemicals where it is economical (or environmentally necessary) to recycle them, so long as they were initially consumed or transformed. Another example might be of electronic components that are integrated into a larger assembly in such a way that they are effectively transformed into part of a larger prototype, and are no longer available for use for other purposes.

74. Section 12(4)(b) of Schedule 45 specifies that a consumable item is not used directly in a qualifying R&D activity related to a trade, profession or business only because the item is used in providing, in support of the activity, services such as:

- (a) any accounting service;
- (b) any administrative service; or
- (c) any secretarial service.

The costs of the consumables used in the supporting activities undertaken by the enterprise outside the R&D project itself are therefore not included as qualifying expenditure.

75. Where consumable items are partly used directly in a qualifying R&D activity, an appropriate apportionment of the expenditure should be made. For example, if there is one electrical supply to a property, and the electricity used in a qualifying R&D activity is not separately metered, then it would be necessary to arrive at a suitable apportionment into qualifying and non-qualifying use. In this respect, the Commissioner would accept that expenditure on lighting the part of the property used directly for the qualifying R&D activity is being incurred directly on such activity, even if there are trivial non-qualifying R&D activities taking place. How a suitable apportionment is to be achieved in practice is dependent on the particular facts of the qualifying R&D activity, and the premises. A broad-brush apportionment based on floor area or staff numbers may prove most suitable where there is no particularly high power consumption based on the nature of the qualifying R&D activity. If the enterprise offers a reasonable apportionment basis, the Commissioner does not envisage detailed enquiries being desirable to establish a slightly more accurate alternative.

Non-qualifying expenditures

76. R&D expenditures not falling within the definition of “qualifying expenditure related to trade, profession or business” (e.g. director’s remuneration, fees paid to staff provider for supplying R&D personnel, fees paid for leasing or maintenance of plant or machinery, consultancy fees paid

for expert advice, licence fees paid for the use of intellectual property rights, incidental testing fees paid to testing labs, etc.) may still be eligible for 100% deduction as Type A expenditures.

77. No additional deduction would be given for an expenditure incurred on the purchase of plant or machinery used in carrying out a qualifying R&D activity. The 100% upfront deduction for an expenditure incurred on plant or machinery as a Type A expenditure under section 8 of Schedule 45 is generous by international standards. Many jurisdictions only allow such capital costs to be written off over a number of years by granting accelerated depreciation allowances.

AMOUNT OF DEDUCTION UNDER SECTION 16B

Total amount of deduction

78. Section 13 of Schedule 45 sets out the formula for calculating the amount allowed to be deducted under section 16B for R&D expenditures incurred during the basis period for a year of assessment. It is the sum of:

- (a) for Type A expenditures – subject to section 13(3) of Schedule 45, 100% of the expenditures; and
- (b) for Type B expenditures:
 - (i) if the total amount of the expenditures exceeds \$2,000,000 – \$6,000,000 (i.e. $\$2,000,000 \times 300\%$) plus 200% of the part of the expenditures that exceeds \$2,000,000; or
 - (ii) if the total amount of the expenditures does not exceed \$2,000,000 – 300% of the expenditures.

Example 4

In developing a digital identity/ know-your-client (ID/ KYC) utility which involved the use of sophisticated biometric authentication techniques, Financial Institution-HK incurred in a year the following expenditures:

	<i>\$ million</i>
<i>Staffing costs of the research team</i>	<i>7</i>
<i>Consumable items</i>	<i>3</i>
<i>Consultancy fee paid to an independent expert</i>	<i>2</i>
<i>Testing fee</i>	<i><u>1</u></i>
<i>Total</i>	<i><u>13</u></i>

If the development of the digital ID/ KYC utility was accepted as a qualifying R&D activity, the staffing costs and the expenditures on consumable items would be eligible for enhanced deduction as Type B expenditures whereas the consultancy fee paid to the independent expert and the testing fee would be eligible for 100% deduction as Type A expenditures. Deduction that can be allowed to Financial Institution-HK for the year would be:

$$(\$2 \text{ million} \times 300\%) + (\$10 \text{ million} - \$2 \text{ million}) \times 200\% + \$3 \text{ million} = \underline{\$25 \text{ million}}$$

R&D expenditure outside Hong Kong

79. Where any Type A expenditure, which qualifies for 100% deduction under section 16B, is incurred for an R&D activity carried on outside Hong Kong in relation to a trade, profession or business, it is necessary to consider whether it should be allowable in full. If the trade, profession or business is carried on solely in Hong Kong, then the full amount of the expenditure is allowable as a deduction in arriving at the chargeable profits.

80. If the trade, profession or business is carried on partly in, and partly out of, Hong Kong, section 13(3) of Schedule 45 provides that the amount allowed to be deducted for the Type A expenditure is the appropriate proportion of the expenditure that the Commissioner considers is reasonable

in the circumstances. The purpose of such subsection is to prevent multinational enterprises from using their global expenditure on R&D to completely off-set their tax liabilities in Hong Kong for years. It empowers the Commissioner to attribute an appropriate portion of Type A expenditure incurred on an R&D activity carried on outside Hong Kong to the part of trade or business in Hong Kong. Therefore, it is necessary to consider the whole of the activities of the trade, profession or business to arrive at a reasonable deductible proportion of such expenditure, which relates to the production of chargeable profits. This is a question of fact to be determined in the light of the circumstances of each case.

R&D EXPENDITURE NOT DEDUCTIBLE

Deduction denied under certain circumstances

81. Section 14 of Schedule 45 specifies certain circumstances under which an R&D expenditure incurred on or after the Commencement Date cannot be deducted under section 16B.

Rights not fully vested in the enterprise

82. Section 14(a)(i) of Schedule 45 provides that no deduction is to be allowed under section 16B for an R&D expenditure that falls within the description in section 6(1)(a) or (c) of the same schedule (i.e. payments made to an R&D institution for “R&D activity”, including “qualifying R&D activity”, related to the enterprise’s trade, profession or business or in-house R&D expenditure) if any rights generated from the R&D activity are not, or will not be, fully vested in the enterprise. The word “rights” has a very wide meaning. It includes not only patented rights but also unregistered know-how and work-in-progress intangibles. If required, patent registration documents and audited financial statements should be produced to prove the entitlement to the rights.

83. Co-ownership of rights is covered by section 1(2) of Schedule 45 which defines “rights” as including a share or an interest in rights. Some enterprises may jointly carry on an R&D activity and the rights generated from that R&D activity are fully and jointly vested in them. In such cases,

the R&D expenditure incurred by each of the enterprises involved can be deducted under section 16B. If any part of the rights is vested in another person who has not participated in the R&D activity, the relevant R&D expenditure cannot be deducted. With this vesting condition, tax symmetry would be maintained since the royalties derived from such rights would be assessed to profits tax whereas the R&D expenditure would be deducted for profits tax purposes.

84. It is not uncommon to use special purpose vehicles to hold intellectual properties generated from R&D activities. If the intellectual property holding entity acts as a nominee for the enterprise performing an R&D activity, the rights generated from the R&D activity would be regarded as fully vested in the enterprise.

Example 5

Enterprise-HK incurred R&D expenditures in an R&D project carried out during the year. It had to bear all the risks relating to the R&D project. Rights generated from the R&D project were held by Associate-HK as nominee for Enterprise-HK's benefits.

For transfer pricing purpose, Enterprise-HK would be regarded as the “economic owner” of the rights generated from the R&D project and was entitled to the returns therefrom. Under such circumstances, the rights could be regarded as fully vested in Enterprise-HK since they were beneficially owned by Enterprise-HK. Enterprise-HK was entitled to claim deduction of its R&D expenditures under section 16B if other conditions were satisfied. However, if Associate-HK was not a nominee but was entitled to the beneficial interests (wholly or partially) of the rights generated from the R&D project, the R&D expenditures incurred by Enterprise-HK may not be fully deducted under section 16B.

R&D activity undertaken for another person

85. Section 14(a)(ii) of Schedule 45 further specifies that no deduction is to be allowed for an R&D expenditure that falls within the description in section 6(1)(a) or (c) of the same schedule if the R&D activity concerned is

undertaken for another enterprise. The reason behind this is that the R&D expenditure incurred would not be at risk since the person undertaking the R&D activity would get compensated regardless of the outcome of the R&D activity. Accordingly, if an enterprise makes a payment to a designated local research institution for a qualifying R&D activity related to its trade, profession or business, only the enterprise can claim enhanced deduction of the payment under section 16B. The designated local research institution cannot claim enhanced deduction of its R&D expenditures incurred on the qualifying R&D activity undertaken for the enterprise. Instead, such expenditures should be deducted by the designated local research institution in accordance with the normal deduction rules under section 16(1) of the Ordinance. This restriction also applies to R&D expenditures incurred by an entity within a group on an R&D activity undertaken for its associates. However, if the intellectual property generated from the R&D activity is held by the entity as the “economic owner” (i.e. the entity performing the development, enhancement, maintenance, protection and exploitation of the intellectual property (DEMPE functions)) for use by its associates on payment of a royalty fee, the R&D activity carried on by the entity would not be regarded as undertaken for the associates. The entity may still be able to claim deduction of the R&D expenditures incurred under section 16B.

Example 6

Due to significant commercial risks involved, SPV-HK was established as a special purpose vehicle to carry out a qualifying R&D activity upon request by Enterprise-HK. Staff were seconded to SPV-HK from Enterprise-HK for undertaking the qualifying R&D activity in Hong Kong. SPV-HK would charge Enterprise-HK an arm’s-length royalty fee for the use of the intellectual property generated from the qualifying R&D activity.

Depending on the facts of the case, if the intellectual property generated from the qualifying R&D activity was wholly and beneficially owned by SPV-HK, SPV-HK could not be regarded as merely undertaking the qualifying R&D activity for Enterprise-HK. In such a case, SPV-HK would be able to claim enhanced deduction of the R&D expenditures incurred, including the staffing costs borne by it in relation to the seconded employees who were

engaged directly and actively in the qualifying R&D activity, under section 16B provided that other conditions were also satisfied.

86. Payments made to “R&D institution” (including “designated local research institution”) for pursuing its object of undertaking “R&D activity” (including “qualifying R&D activity”) related to the class of trade, profession or business to which the enterprise’s trade, profession or business belongs are not subject to the aforesaid two conditions. Very often, the R&D activity is not undertaken for the enterprise nor will the rights generated from such R&D activity be vested in the enterprise.

Cost contribution arrangements/ subcontracting to other group companies

87. Associated enterprises in a multinational group may enter into a cost contribution arrangement (CCA) for carrying out an R&D activity. The CCA is a contractual arrangement among business enterprises to share the contributions and risks involved in the joint development, production or the obtaining of intangibles, tangible assets or services with the understanding that such intangibles, tangible assets or services are expected to create benefits for the individual businesses of each of the participants.

88. Two types of CCAs are commonly encountered: those established for the joint development, production or the obtaining of intangibles or tangible assets (development CCAs); and those for obtaining services (services CCAs). Although each particular CCA should be considered on its own facts and circumstances, key differences between these two types of CCAs will generally be that development CCAs are expected to create ongoing, future benefits for participants, while services CCAs will create current benefits only. Development CCAs, in particular with respect to intangibles, often involve significant risks associated with what may be uncertain and distant benefits, while services CCAs often offer more certain and less risky benefits. A development CCA in which benefits are uncertain and distant is likely to give rise to greater risks than does a services CCA in which benefits are current. For the purposes of deduction of R&D expenditure, only development CCAs need to be considered.

89. Where the enterprise has undertaken part or all of the underlying R&D activity under a development CCA, the share of R&D expenditure

borne by the enterprise under the CCA may be accepted by the Commissioner as its in-house R&D expenditure if all of the following conditions are satisfied:

- (a) The participants would include only enterprises expected to derive mutual and proportionate benefits from the R&D activity under the CCA itself (and not just from performing part or all of that activity). An enterprise that solely performs the subject activity (e.g. performing research functions) but does not receive an interest in the output of the CCA, would not be considered a participant in the CCA but rather a service provider to the CCA.
- (b) The arrangement would specify the nature and extent of each participant's interest in the results of the R&D activity under the CCA, as well as its expected respective share of benefits.
- (c) No payment other than the CCA contributions, appropriate balancing payments and buy-in payments would be made for the rights generated from the R&D activity under the CCA. Therefore, participants may exploit the intellectual property without paying additional consideration to any party for such property.
- (d) The value of participants' contributions would be determined in accordance with the Hong Kong transfer pricing rules or OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations, and where necessary, balancing payments should be made to ensure the proportionate shares of contributions align with the proportionate shares of expected benefits from the arrangement. Excessive contributions made by the enterprise that are inconsistent with the arm's length principle would not qualify for deduction under section 16B.
- (e) The arrangement may specify provision for balancing payments and/or changes in the allocation of contributions prospectively after a reasonable period of time to reflect

material changes in proportionate shares of expected benefits among the participants.

- (f) Adjustments would be made as necessary (including the possibility of buy-in and buy-out payments) upon the entrance or withdrawal of a participant and upon termination of the CCA.
- (g) The enterprise must actively participate in the R&D project under the CCA and play a significant role in carrying on the R&D activity. Mere monetary contributions without active participation in the R&D project are no more than expenditure for acquiring a right to exploit the intellectual property generated from the R&D project and hence should not qualify for deduction under section 16B by virtue of section 6(4)(b) of Schedule 45 to the Ordinance. To meet the “active participation” requirement, the enterprise must participate in carrying out the R&D project itself. In other words, the enterprise must:
 - (i) possess the capacity, knowledge and expertise to control performance of the DEMPE functions;
 - (ii) have the financial capacity and capability to do so; and
 - (iii) have its own R&D personnel who have the capability to establish research programmes, monitor progress, decide to terminate or change course, design projects, budgeting, etc.
- (h) Any rights generated from the R&D activity must be co-owned by the enterprise with other participants under the CCA such that the rights could be regarded as jointly and fully vested in the enterprise. Thus, an ownership interest in any intellectual property resulting from the R&D activity under the CCA must be contractually provided for each participant from the outset. As explained above, holding an intellectual property through a nominee company is accepted.

- (i) The R&D activity under the CCA must be undertaken for all the participants including the enterprise. The activity cannot be undertaken for persons other than the participants under the CCA.

Such expenditure under the CCA would qualify for 100% deduction or enhanced deduction provided that other conditions laid down in section 16B and Schedule 45 to the Ordinance are also fulfilled.

90. It should be noted that only qualifying R&D activities (i.e. activities wholly undertaken and carried on in Hong Kong) are eligible for enhanced deduction. If the R&D project under the CCA is carried on partly in Hong Kong and partly outside Hong Kong, only the contributions borne by the enterprise for that part of the R&D project carried on in Hong Kong can qualify for enhanced deduction though the whole R&D project seeks to directly contribute to achieving an advance in science or technology by resolving scientific or technological uncertainty. For its share of contributions towards the part of the R&D project carried on outside Hong Kong, the enterprise may claim 100% deduction as Type A expenditures.

91. Sometimes, the enterprise may incur R&D expenditure in excess of its share of contributions required under a CCA. The enterprise would then receive charge-out payments from other participants. Such charge-out payments would not be assessed to tax but would have to be deducted from the R&D expenditure that ranks for deduction under section 16B. This is because section 14(b)(iv) of Schedule 45 disallows deduction for any R&D expenditure met by others.

92. Where the value of a participant's share of overall contributions under a CCA at the time the contributions are made is not consistent with that participant's share of expected benefits under the CCA, the contributions made by at least one of the participants will be inadequate, and the contributions made by at least one other participant will be excessive. In such a case, the arm's length principle would generally require that an adjustment be made. This will generally take the form of an adjustment to the contribution through making or imputing a further balancing payment. Balancing payments may be made by participants to "top up" the value of the contributions when their proportionate contributions are lower than their

proportionate expected benefits. Such adjustments may be anticipated by the participants upon entering into the CCA, or may be the result of periodic re-evaluation of their share of the expected benefits and/or the value of their contributions. The tax treatment of such balancing payments would follow that of charge-in/ charge out payments.

93. Variations between a participant's proportionate share of the overall contributions and that participant's proportionate share of the overall expected benefits may occur in a particular year. If that CCA is otherwise acceptable and carried out faithfully, the Commissioner would not make an adjustment based on the results of a single fiscal year. Consideration would be given to whether each participant's proportionate share of the overall contributions is consistent with the participant's proportionate share of the overall expected benefits from the arrangement over a period of years. Separate balancing payments might be made for pre-existing contributions and for current contributions, respectively. Alternatively, it might be more reliable or administrable to make an overall balancing payment relating to pre-existing contributions and current contributions collectively.

94. It is crucial that the value of the enterprise's contributions under the CCA should be determined on an arm's length basis. The amount of contributions paid by the enterprise should reflect the future benefits that it would receive under the CCA. Sometimes, *ex post* outcomes can provide a pointer about the arm's length nature of the *ex ante* pricing arrangement agreed upon by the associated enterprises, and the existence of uncertainties at the time of the transaction. If there are differences between the *ex ante* projections and the *ex post* results which are not due to unforeseeable developments or events, the differences may give an indication that the pricing arrangement agreed upon by the associated enterprises at the time the transaction was entered into may not have adequately taken into account the relevant developments or events that might have been expected to affect the value of the intangible and the pricing arrangements adopted. In such circumstances, additional assessments would be raised on the enterprise to disallow deduction in respect of the excessive portion of the CCA contributions under section 60 of the Ordinance.

95. Subsequent transfer pricing adjustments made by other tax jurisdictions in respect of the income, including royalty income, allocated

between the associated enterprises under a CCA would also trigger the need to verify the arm's length basis on which the value of CCA contributions was determined. Since the share of contributions made by the enterprise must align with its share of expected benefits received under the CCA, a smaller amount of income allocated to the enterprise as a result of a transfer pricing audit would imply that the CCA contributions previously made by the enterprise were excessive. Accordingly, the amount of R&D deduction that can be allowed to the enterprise under section 16B would have to be adjusted downwards.

Example 7

Enterprise-HK, which belonged to a multinational group, carried on a qualifying R&D activity to develop an intellectual property for use by the whole group. All the enterprises within the group including Enterprise-HK had to make financial contributions towards the costs of the qualifying R&D activity pursuant to a CCA. The intellectual property generated from the activity was to be held by Associate-F in Jurisdiction-F as a nominee for them. During the year, the share of R&D expenditures, comprising staffing costs and expenditures on consumable items, borne by Enterprise-HK under the CCA was \$5 million.

Since Associate-F acted as a nominee for holding the rights generated from the qualifying R&D activity, the rights could be regarded as jointly and fully vested in all the enterprises within the group including Enterprise-HK. Thus, Enterprise-HK was entitled to claim enhanced deduction of its share of R&D expenditure of \$12 million under section 16B (i.e. \$2 million \times 3 + \$3 million \times 2).

Example 8

Enterprise-HK has two wholly-owned subsidiaries in Jurisdiction-F, Enterprise-F1 and Enterprise-F2. All three enterprises jointly undertook an R&D project to develop a new and sophisticated artificial intelligence technology. Each of them contributed the talents and performed an important part of the research work. The relevant R&D expenditures were borne by them in equal share

under a CCA and the intellectual property generated from the R&D project was to be held by Associate-HK as a nominee for them. During the year, Enterprise-HK incurred staffing costs and expenditures on consumable items totalling \$2 million and each of Enterprise-F1 and Enterprise-F2 incurred \$3.5 million on the R&D project. In accordance with the CCA, Enterprise-HK paid \$0.5 million to each of Enterprise-F1 and Enterprise-F2 for the contributions made by them in Jurisdiction-F.

Since Enterprise-HK actively participated in the qualifying R&D activity in Hong Kong, its share of the qualifying expenditure of \$2 million incurred in Hong Kong could be eligible for 300% deduction. Enterprise-HK could also claim 100% deduction in respect of its share of R&D expenditures incurred in Jurisdiction-F (i.e. totalling \$1 million) as in-house Type A expenditures.

Example 9

Enterprise-HK ran a manufacturing operation in Hong Kong within a multinational group in the pharmaceutical industry. The group had a research laboratory operated by Enterprise-F in Jurisdiction-F. Enterprise-F undertook an R&D project on a new drug for the whole group. The patent generated from the R&D project would be held by Enterprise-F on behalf of the whole group. Since Enterprise-HK had to use the patent for manufacturing the drug, it made financial contributions of \$5 million to Enterprise-F under a CCA in a year of assessment.

In this case, Enterprise-HK did not carry on the R&D activity itself or actively participate in the R&D activity. Enterprise-F was neither a designated local research institution nor a university/college. Enterprise-HK was not eligible for the 100% deduction or enhanced deduction in respect of its payments made to Enterprise-F pursuant to the CCA under section 16B.

Example 10

Enterprise-HK entered into a CCA with its overseas associates for developing a novel technology used in the textile industry. Enterprise-HK did not have R&D personnel to carry out research works but controlled the budget of the R&D project. Enterprise-HK contributed 50% funding to the R&D project and agreed to bear the financial risk associated with possible failure of the R&D project.

Except the budget control function which was performed in Hong Kong, the whole R&D project was carried on outside Hong Kong. As such, the R&D project was not a qualifying R&D activity. Since Enterprise-HK did not have the capability to control the DEMPE functions, it could not be regarded as actively participated in the R&D project. Therefore, Enterprise-HK was entitled to neither the 100% deduction nor the enhanced deduction in respect of the CCA contributions incurred for the R&D project under section 16B.

Example 11

Enterprise-HK entered into a CCA with two overseas associates, Associate-F1 and Associate-F2, for an R&D project aiming to develop a new product. All three participants incurred R&D costs in Years 1 and 2. The intellectual property was successfully developed in Year 2, which had a life cycle of 2 years and generated sales revenue in Years 2 and 3. The participants adopted expected sales revenue of the following year as an allocation key for the R&D costs incurred in the current year. Reasonably Anticipated Benefits (RAB) worked out were as follows:

	<i>Enterprise-HK</i>	<i>Associate-F1</i>	<i>Associate-F2</i>
	<i>\$ million</i>	<i>\$ million</i>	<i>\$ million</i>
<i>RAB in Year 1 ^(Note 1)</i>	<i>50</i>	<i>10</i>	<i>40</i>
<i>RAB in Year 2 ^(Note 2)</i>	<i><u>40</u></i>	<i><u>10</u></i>	<i><u>50</u></i>
<i>Total RAB</i>	<i><u>90</u></i>	<i><u>20</u></i>	<i><u>90</u></i>

Notes:

1: Based on the expected sales revenue in Year 2

2: Based on the expected sales revenue in Year 3

In Year 1, Enterprise-HK incurred \$1 million Type B expenditure (i.e. staffing costs and expenditures on consumable items) and \$2 million Type A expenditure. Enterprise-HK, Associate-F1 and Associate-F2 allocated the R&D costs based on the RAB ratio in Year 1 as follows:

	Enterprise-HK	Associate-F1	Associate-F2	Total
	\$ million	\$ million	\$ million	\$ million
R&D costs incurred	3	5	2	10
RAB in Year 1	50	10	40	100
R&D costs allocated	5	1	4	10
Net Charge-in/ (Charge-out) payment	2	(4)	2	-

In Year 2, Enterprise-HK incurred \$2 million Type B expenditure and \$1 million Type A expenditure. Enterprise-HK, Associate-F1 and Associate-F2 allocated the R&D costs based on the RAB ratio in Year 2 as follows:

	Enterprise-HK	Associate-F1	Associate-F2	Total
	\$ million	\$ million	\$ million	\$ million
R&D costs incurred	3	1	1	5
RAB in Year 2	40	10	50	100
R&D costs allocated	2	0.5	2.5	5
Net Charge-in/ (Charge-out) payment	(1)	(0.5)	1.5	-

While RAB can be measured in terms of sales revenue, gross profits or EBITDA, such performance indicators should be used with caution as they may be affected by many factors other than the benefits from the intellectual property, such as the marketing efforts made by individual participants. Adjustments may be necessary to take into account such factors when determining the RAB.

For the purpose of determining whether a CCA satisfies the arm’s length principle, at the time of entering into a CCA, each participant’s proportionate share of the overall contributions to a CCA must be consistent with its proportionate share of the overall expected benefits to be received under the arrangement. In general, instead of allocating the R&D costs based on the RAB year by year, the R&D costs should be allocated by reference to the total expected sales revenue derived by each participant from the intellectual property during its useful life. The R&D costs should be allocated among Enterprise-HK, Associate-F1 and Associate-F2 as follows:

Year 1:

	Enterprise-HK	Associate-F1	Associate-F2	Total
	\$ million	\$ million	\$ million	\$ million
R&D costs incurred	3	5	2	10
Total RAB	90	20	90	200
R&D costs allocated	4.5	1	4.5	10
Net Charge-in/ (Charge-out) payment	1.5	(4)	2.5	-

Year 2:

	Enterprise-HK	Associate-F1	Associate-F2	Total
	\$ million	\$ million	\$ million	\$ million
R&D costs incurred	3	1	1	5
Total RAB	90	20	90	200
R&D costs allocated	2.25	0.5	2.25	5
Net Charge-in/ (Charge-out) payment	(0.75)	(0.5)	1.25	-

Charge-in/ charge-out payments may be made and booked in the accounts on a “net basis” or “gross basis”, depending on the contractual terms of the CCA. Under the “net basis”, the amount of the charge-in/ charge-out payment for a participant would be calculated by deducting the amount of R&D costs to be borne by that participant under the CCA from the amount of its self-incurred R&D costs. On the other hand, “gross basis” means that each of

the participants would charge-out the whole amount of self-incurred R&D costs to one of the participants first to form a cost pool and then there would be a charge-in payment from the pool equal to the amount of R&D costs to be borne by each of the participants under the CCA. Whichever basis is adopted, the total amount of deduction that could be allowed under section 16B should be the same. The tax treatment of charge-in/ charge-out payments should be applied based on the net position (i.e. net charge-in/ charge-out payments).

In Year 1, Enterprise-HK was entitled to enhanced deduction in respect of \$1 million Type B expenditure and 100% deduction in respect of \$2 million Type A expenditure. In addition, the net charge-in payment of \$1.5 million made by Enterprise-HK under the CCA could be deducted as Type A expenditure.

In Year 2, the net charge-out payment of \$0.75 million received by Enterprise-HK under the CCA should be netted off from its R&D costs incurred under section 14(b)(iv) of Schedule 45. It would be divided into Type A and Type B expenditures based on the ratio of Type A and Type B expenditures directly incurred by Enterprise-HK. Therefore, Enterprise-HK could only claim enhanced deduction in respect of \$1.5 million Type B expenditure (\$2 million – \$0.5 million) and 100% deduction in respect of \$0.75 million Type A expenditure (\$1 million – \$0.25 million).

In case the actual shares of benefits from the CCA among Enterprise-HK, Associate-F1 and Associate-F2 differ materially from the proportionate shares of expected benefits as estimated at the outset, balancing payments or adjustments to the allocation of the R&D costs among the participants under the arrangement may be required.

96. An enterprise that becomes a participant in an already active CCA might obtain an interest in any results of prior CCA activity, such as completed or work-in-progress intangibles. Under the arm's length principle, any such transfer of intangibles must be compensated based on an arm's length value for the transferred interest. Similar issues could arise when a

participant leaves a CCA. In particular, a participant that leaves a CCA may dispose of its interest in the results, if any, of past CCA activity (including work-in-progress) to the other participants. Such compensation is referred to as “buy-in payment” and “buy-out payment”. While a buy-in payment represents a consideration for acquisition of rights generated from an R&D activity and hence cannot be deducted under section 16B per section 6(4)(b) of Schedule 45, a buy-out payment received by the enterprise, to the extent of the amount of deductions that have been allowed under section 16B, should be treated as a trading receipt arising in or derived from Hong Kong by virtue of section 17 of Schedule 45. See the explanations for the taxability of proceeds of sale in paragraphs 104 to 112 below.

97. Subcontracting should be distinguished from a CCA. Under a subcontracting arrangement, the subcontractor would not be entitled to share the benefits derived from the R&D project. Strictly, R&D subcontracting fees paid to an overseas associate, which is not an R&D institution or a designated local research institution, cannot be deducted under section 16B. Taking note that some enterprises may not have the full capability to wholly undertake an R&D project in Hong Kong, the Commissioner, as a concession, is prepared to allow deduction of the subcontracting fee paid to an overseas associate for the R&D services provided if such fee is not more than 20% of the total costs of the R&D project and the subcontracting fee is not more than \$2 million. Therefore, if an enterprise only subcontracts an insignificant part of an R&D project to its associate outside Hong Kong (e.g. producing parts for a prototype) while still responsible for undertaking in Hong Kong the core part (i.e. 80% or more of the total costs) of the R&D project, the subcontracting fee paid to the associate may be regarded as an in-house Type A expenditure eligible for the 100% deduction under section 16B. Conversely, if the enterprise subcontracts the core part of the R&D project to the associate, such subcontracting fee cannot be deducted under section 16B. In some cases, the R&D project lasts longer than one year. If a subcontracting fee has been allowed to be deducted under section 16B in a particular year but it later transpires that the aggregate amount of the subcontracting fees paid for the whole R&D project turns out to be greater than \$2 million, the aforesaid concession would not apply. In such scenario, additional assessments would be raised under section 60 to withdraw the deduction granted.

Example 12

Enterprise-HK entered into a contract with its overseas associate, Associate-F, to develop a novel technology in Jurisdiction-F at a contract price of \$10 million. Any intellectual property rights generated from the R&D project would be wholly owned by Enterprise-HK. Enterprise-HK did not participate in the R&D works and only monitored the progress of the R&D project by reviewing the progress reports furnished by Associate-F and attending their regular meetings.

Clearly, the above mentioned arrangement would not be regarded as a CCA but a pure subcontracting arrangement. Since Associate-F was not a designated local research institution or a university/ college (i.e. not an R&D institution), the subcontracting fee of \$10 million paid by Enterprise-HK to Associate-F did not fall within the definition of R&D expenditure under section 6 of Schedule 45. Hence, Enterprise-HK was not entitled to deduct the subcontracting fee of \$10 million under section 16B.

Example 13

Enterprise-HK entered into a subcontracting arrangement with Associate-F in Jurisdiction-F to develop a sophisticated robot with various artificial intelligence features at a contract price of \$8 million. However, Associate-F merely performed some specific testing work. The core of the R&D work was performed by Enterprise-HK in its own laboratory in Hong Kong staffed with R&D personnel. Enterprise-HK bore the risks associated with the R&D project and any intellectual property rights generated therefrom would be owned by Enterprise-HK. Enterprise-HK incurred in Hong Kong staffing costs and expenditures on consumable items totalling \$5 million for this R&D project, excluding the fees paid to the overseas associate.

It was Enterprise-HK which performed all the R&D functions, used its assets and bore the relevant risks. Under such circumstances, the R&D project could be treated as Enterprise-HK's in-house

qualifying R&D activity. Therefore, Enterprise-HK would be entitled to an enhanced deduction of the qualifying expenditure (i.e. \$12 million ($\$2 \text{ million} \times 300\% + \$3 \text{ million} \times 200\%$)).

Subsidies and grants received

98. Section 14(b) of Schedule 45 stipulates that no deduction can be allowed under section 16B if the R&D expenditure is, or is to be, met directly or indirectly by:

- (a) the Government of the Hong Kong Special Administrative Region;
- (b) the government of any place outside Hong Kong;
- (c) any public or local authority in Hong Kong or elsewhere; or
- (d) another person.

99. So where an enterprise incurs an R&D expenditure and part of such expenditure is, or is to be, met directly or indirectly by the aforesaid parties, only the net amount qualifies for deduction under section 16B. In case cash rebate or reimbursement of R&D expenditure is received after the enterprise has been granted deduction of such expenditure, the enterprise should notify the Commissioner within a reasonable time. Additional assessment would then be raised to disallow deduction of the R&D expenditure concerned. Failure to notify the Commissioner of any reimbursement or cash rebate received may result in penal actions.

100. Section 14(b) of Schedule 45 only covers those scenarios where the R&D expenditure would be reimbursed by others and thus would not be ultimately borne by the enterprise. It is not meant to disallow deduction of R&D expenditure where the R&D activity concerned is undertaken for the purpose of producing tailor-made goods for a particular customer or constructing a building or structure under a contract at an agreed price. Even though the enterprise may have taken into account the cost of the R&D activity in determining the contract price, the R&D expenditure incurred for the R&D activity would not be treated as indirectly met by others simply

because proceeds from sale of the goods or contractual payments under the building contract are received from the customer.

Example 14

The Government awarded Enterprise-HK with a contract to construct a green building at a consideration of \$5 billion. Due to the specifications required, Enterprise-HK had to undertake a qualifying R&D activity on new construction materials. Enterprise-HK incurred a total of R&D expenditure of \$10 million for such purpose and retained the intellectual property developed which it could use for other future contracts.

Though the contract sum of \$5 billion had covered the overall cost of the construction project including the amortised portion of the R&D expenditure incurred, such part of the R&D expenditure would not be regarded as indirectly met by the Government under section 14(b) of Schedule 45. It was because the contract sum was paid for the building rather than the R&D activity undertaken by Enterprise-HK.

Example 15

The Government paid \$150 million to a designated local research institution for carrying on a qualifying R&D activity. Any intellectual property generated from that activity would be co-owned by the Government and the institution on a 50:50 basis. During the year, the designated local research institution incurred \$200 million R&D costs on the qualifying R&D activity.

Depending on the terms of the contractual arrangement and the facts of the case, if the payment of \$150 million from the Government was in the nature of a service fee (i.e. assessable profits) received pursuant to a commercial contract and not a government grant for R&D, it would not be treated as a reimbursement of the R&D costs incurred by the designated local research institution. As such, one half of the \$200 million R&D costs incurred by the institution for its share of economic ownership

of the intellectual property should be eligible for enhanced deduction or 100% deduction under section 16B. The remaining half of \$100 million, incurred by the institution for earning the taxable service fee of \$150 million from the Government, should be deductible under section 16(1) of the Ordinance.

If the service fee was paid by a private Hong Kong enterprise to the designated local research institution in return for the co-ownership in the intellectual property, the private enterprise might also claim enhanced deduction in respect of the service fee.

Tax avoidance arrangements

101. Section 14(c) of Schedule 45 introduces a main purpose test for tackling tax avoidance arrangements involving deduction of R&D expenditures. No deduction is to be allowed under section 16B for an R&D expenditure if it is incurred under an arrangement the main purpose, or one of the main purposes, of which is to enable a person to obtain:

- (a) a deduction to which the person would not otherwise be entitled under section 16B; or
- (b) a deduction of a greater amount than the amount to which the person would otherwise be entitled under section 16B.

102. This provision only targets at those who seek to exploit the R&D deduction regime by artificial means either without actually carrying out the R&D activity, or by doing so on a smaller scale than claimed. It is not meant to deny deduction for the vast majority of genuine claimants.

Example 16

Enterprise-HK entered into a series of interdependent transactions as a part of a tax planning scheme. The concept was that Enterprise-HK contracted out an R&D project to a designated local research institution at an inflated fee of \$100 million. 80% of the R&D expenditure was financed by a non-recourse loan from an overseas bank. The designated local research institution

further subcontracted the R&D project to another institution at a much lower fee of \$20 million. The R&D work carried out by the institution in Hong Kong constituted a qualifying R&D activity. Excess fee received by the designated local research institution (i.e. \$80 million) was passed back in various forms and went back to the overseas bank in various ways.

Enterprise-HK entered into an arrangement involving a circular or other artificial structure to inflate the R&D expenditure without a commensurate level of R&D activity. If the main purpose of the arrangement was to obtain a greater deduction than Enterprise-HK would not otherwise be entitled to under section 16B, the deduction allowed to Enterprise-HK would be restricted to \$20 million R&D expenditure and the excess of \$80 million would be disallowed under section 14(c) of Schedule 45.

Example 17

Enterprise-HK1, Enterprise-HK2 and Enterprise-HK3 formed a partnership for undertaking an in-house R&D project on creating a new vaccine. 90% of the partnership capital was contributed by Enterprise-HK2 and Enterprise-HK3 with the remaining balance funded by Enterprise-HK1. Enterprise-HK1 carried out all the research work and spent \$100 million qualifying expenditure on the R&D project during the year. Enterprise-HK1 claimed that all the R&D work was performed on behalf of the partnership and the \$100 million qualifying expenditure was booked in the partnership's accounts. The partnership did not have other business activities. As the partnership only charged minimal royalties for licensing the intellectual property rights arising from the vaccine research to Enterprise-HK1, the partnership incurred a substantial tax loss after taking into account the enhanced deduction for the qualifying expenditure. As a result, Enterprise-HK2 and Enterprise-HK3 sought to set off their shares of the partnership's tax loss against their own profits.

The partnership structure had the features of a sham. The real person which carried on the qualifying R&D activity and incurred

the R&D expenditure should be Enterprise-HK1. The underlying purpose of the arrangement was to enable Enterprise-HK2 and Enterprise-HK3 to obtain tax loss relief arising from the enhanced deduction of R&D expenditure. Since Enterprise-HK1, Enterprise-HK2 and Enterprise-HK3 had entered into an arrangement which enabled the partnership to claim enhanced deduction to which it would not otherwise be entitled under section 16B, no deduction of the R&D expenditure could be allowed to the partnership by virtue of section 14(c) of Schedule 45. Instead, Enterprise-HK1 would be entitled to claim enhanced deduction under section 16B.

Example 18

Instead of carrying on a qualifying R&D activity in-house, Enterprise-HK outsourced the qualifying R&D activity to Associate-HK, which was a designated local research institution. Enterprise-HK then claimed enhanced deduction in respect of the R&D service fee paid to Associate-HK. The fee was calculated as follows:

	<i>\$ million</i>
<i>Direct R&D staffing costs</i>	<i>70</i>
<i>Expenditures on consumable items</i>	<i>30</i>
<i>Other R&D expenditure</i>	<i>50</i>
<i>Overhead and administrative expenses</i>	<u><i>20</i></u>
<i>Total cost</i>	<i>170</i>
<i>Mark-up</i>	<u><i>30</i></u>
<i>R&D service fee</i>	<u><u><i>200</i></u></u>

If Associate-HK was accepted as providing genuine R&D services to Enterprise-HK and the R&D service fee of \$200 million was determined on an arm's length basis, Enterprise-HK would be entitled to enhanced deduction in respect of \$200 million. However, if Associate-HK was merely a shell company and Enterprise-HK continued to perform all the R&D functions, the main purpose test under section 14(c) of Schedule 45 would be invoked to treat the R&D project as Enterprise-HK's in-house

qualifying R&D activity. Then Enterprise-HK could only claim enhanced deduction in respect of the staffing costs and expenditures on consumable items totalling \$100 million. The other R&D expenditure and overhead allocated to the R&D project would be deducted as Type A expenditure.

No multiple deduction

103. Under section 15 of Schedule 45, an R&D expenditure may only be deducted for one trade, profession or business. This is to ensure that no multiple deductions can be allowed to different businesses in respect of the same R&D expenditure.

PROCEEDS OF SALE

Sale proceeds deemed as trading receipts

104. Despite the exclusion relating to the sale of capital assets in section 14 of the Ordinance, certain proceeds from the sale of plant or machinery used for an R&D activity or of the rights generated from an R&D activity are deemed as trading receipts chargeable to profits tax.

Sale of plant or machinery used for R&D activities

105. Under section 16 of Schedule 45, where plant or machinery in respect of which deduction of capital expenditure has been allowed under section 16B ceases to be used by an enterprise for any R&D activity and is subsequently sold, the sale proceeds, to the extent that they are not chargeable to profits tax under any other provision and do not exceed the total amount of deductions previously allowed, are treated as a trading receipt arising in or derived from Hong Kong of the enterprise's trade, profession or business accruing at the time of the sale or the date immediately before the cessation of business if the sale occurs on or after the date of cessation. For the purposes of this section, a sale occurs at the time of its completion or the time when possession of the plant or machinery is given, whichever happens earlier.

106. Where any such plant or machinery is destroyed, it is to be treated as if it had been sold immediately before its destruction. Any insurance moneys or other compensation of any description received in respect of the destruction, and any money received in respect of the remains of the plant or machinery, are to be treated as if they were the proceeds of that sale and be assessed as a trading receipt.

Sale of rights generated from R&D activities

107. Under section 17 of Schedule 45, where any rights generated from one or more R&D activities, for which deduction of expenditure or expenditures has been allowed under section 16B, are sold by an enterprise, the sale proceeds not chargeable to profits tax under any other provision must be treated as a trading receipt arising in or derived from Hong Kong of the enterprise's trade, profession or business of a specified amount accruing at the time of completion of the sale or the date immediately before the cessation of business if the sale is completed on or after the date of cessation. The word "rights" includes not only intellectual property rights protected under the intellectual property law but also unregistered rights arising from an R&D activity like rights to know-how or any new knowledge or techniques.

108. If the expenditures deducted for the R&D activity or activities that generated the rights (underlying activities) consist of solely Type A expenditures or Type B expenditures, the specified amount deemed as a trading receipt would be the lesser of the total amount of deductions allowed under section 16B for the expenditures and the proceeds of sale of the rights.

109. On the other hand, if the expenditures deducted for the underlying activities consist of both Type A expenditures and Type B expenditures, the specified amount would be calculated in accordance with the following steps:

Step 1:

Divide the proceeds of sale into **sale proceeds A** and **sale proceeds B** according to the ratio between:

- (a) Type A expenditures that were incurred on the underlying activities; and
- (b) Type B expenditures that were incurred on the underlying activities.

Step 2:

Calculate an **amount A** which equals the lesser of:

- (a) the total amount of deductions for Type A expenditures;
and
- (b) sale proceeds A.

Step 3:

Calculate an **amount B** which equals the lesser of:

- (a) the total amount of deductions for Type B expenditures;
and
- (b) sale proceeds B.

Step 4:

Add amount A and amount B together to get the **specified amount**.

110. If any relevant Type A expenditure for the underlying activities was not allowed to be deducted in full because of the operation of section 13(3) of Schedule 45 or section 16B(2) (as in force before the Commencement Date of the 2018 Amendment (No. 7) Ordinance), the proceeds of sale for the purpose of calculating the amount of deemed trading receipt are to be adjusted downward. The adjusted proceeds of sale are to bear the same ratio to the actual proceeds of sale as the ratio that the total amount of deduction or deductions allowed for all Type A expenditures for the underlying activities bears to those Type A expenditures. In other words, the sale proceeds will be restricted to such part as proportionate to the extent of the deductible proportion of Type A expenditures. The amount assessable shall not exceed the amount of deduction previously allowed.

Example 19

Enterprise-HK carried on its trade partly in Hong Kong and partly outside Hong Kong. In Year 1, Enterprise-HK undertook an R&D project where part of the R&D work was performed outside Hong Kong. In respect of such overseas R&D activity, Enterprise-HK incurred Type A expenditure of \$1 million. For the qualifying R&D activity carried on in Hong Kong, Enterprise-HK incurred Type B expenditure of \$5 million. Enterprise-HK claimed that half of its profits were derived outside Hong Kong for Year 1. Enterprise-HK

was allowed deduction of the following amount under section 16B:

<i>R&D expenditure</i>	<i>Amount incurred</i> \$ million	<i>Deduction allowed</i> \$ million
Type A expenditure	1	0.5 ¹
Type B expenditure	<u>5</u>	<u>12.0</u> ²
Total	<u>6</u>	<u>12.5</u>

Note 1: \$1 million ÷ 2 (per section 13(3) of Schedule 45)

Note 2: \$2 million × 300% + \$3 million × 200%

In Year 3, the patent generated from the R&D project was sold for \$12 million.

The proceeds of sale of the patent, treated as a trading receipt under section 17 of Schedule 45, would be calculated as follows:

Step 1:

$$\begin{aligned}\text{Sale proceeds A} &= \$12 \text{ million} \times 1 \div 6 \\ &= \underline{\$2 \text{ million}}\end{aligned}$$

$$\begin{aligned}\text{Sale proceeds B} &= \$12 \text{ million} \times 5 \div 6 \\ &= \underline{\$10 \text{ million}}\end{aligned}$$

Step 2:

$$\begin{aligned}\text{Adjusted sale proceeds A} &= \$2 \text{ million} \times 0.5 \div 1 \\ &= \underline{\$1 \text{ million}}\end{aligned}$$

As the amount of deduction for Type A expenditure is less than adjusted sale proceeds A, amount A is equal to \$0.5 million.

Step 3:

As sale proceeds B is less than the total amount of deduction for Type B expenditure, amount B is equal to \$10 million.

Step 4:

$$\begin{aligned}\text{Specified amount} &= \$0.5 \text{ million} + \$10 \text{ million} \\ &= \underline{\$10.5 \text{ million}}\end{aligned}$$

Thus, the taxable amount of the sale proceeds would be \$10.5 million.

111. Section 17 of Schedule 45 is also applicable in situations where the intellectual property rights are not held by the enterprise itself but by its related person acting as a nominee for the enterprise. Since the R&D expenditure was incurred by the enterprise, the enterprise is the economic owner of the intellectual property rights and thus should be entitled to receive the returns derived from the exploitation of the intellectual property rights including the returns generated from the disposition of such rights (i.e. the sale proceeds from the subsequent disposal of the intellectual property rights). As such, the sale proceeds should be treated as a trading receipt of the enterprise. This follows transfer pricing principles under which an enterprise should be compensated for the value created through functions performed, assets used and risks assumed (e.g. DEMPE functions).

Sale of plant or machinery and rights before 1 April 2018

112. Sections 16 and 17 of Schedule 45 would apply to a sale of plant or machinery, and to a sale of rights generated from an R&D activity, that occurs on or after 1 April 2018. For those sales occurred before that date, section 16B, as in force before the Commencement Date, continues to apply and deem the sale proceeds as taxable trading receipts.

ROYALTIES FROM INTELLECTUAL PROPERTIES

Alignment of taxation with value creation

113. Section 15(1)(bc) of the Ordinance stipulates that the following sums, not otherwise chargeable to profits tax, received by or accrued to a person should be deemed to be trading receipts arising in or derived from Hong Kong from a trade, profession or business carried on in Hong Kong:

- (a) sums for the use, or the right to the use, outside Hong Kong of any intellectual property or know-how generated from any R&D activity in respect of which a deduction is allowable under section 16B in ascertaining profits of the person under profits tax; or
- (b) sums for imparting or undertaking to impart knowledge

directly or indirectly connected with the use outside Hong Kong of any such property or know-how.

This provision applies to royalty income or other income of similar nature in connection with a deduction claim under section 16B. Generally, it does not relate to the expenses incurred by a service provider merely carrying out in Hong Kong an R&D activity for a client.

114. Under section 15(8), the term “intellectual property” includes copyright material, design, layout-design (topography) of an integrated circuit, patent, plant variety right, secret process or formula or any other property or right of a similar nature. The word “know-how” is defined as any industrial information or techniques likely to assist in the manufacture or processing of goods or materials. Section 15(1)(bc) would only apply to sums received and accrued after the Commencement Date of the 2018 Amendment (No. 7) Ordinance (i.e. 2 November 2018).

115. According to the international tax rules, income should be taxed at the place where the value is created and returns from intangibles should accrue to the entities that carry out the DEMPE functions. So if an intellectual property or know-how is created or developed through an R&D activity of an enterprise carrying on a trade or business in Hong Kong, the royalties derived from licensing such intellectual property or know-how should be regarded as Hong Kong sourced income and hence should be subject to Hong Kong profits tax. Section 15(1)(bc) conforms to the territorial source principle and the international tax rules on intangible assets.

GENERAL ANTI-AVOIDANCE PROVISIONS

Sections 61 and 61A

116. The Commissioner will generally act in accordance with this Practice Note in processing deduction claims for R&D expenditures. However, in cases where tax avoidance is involved or this R&D deduction regime is abused to secure a result which is not intended under the 2018 Amendment (No. 7) Ordinance, the Commissioner will consider invoking the general anti-avoidance provisions under section 61 and/or 61A of the

Ordinance as appropriate to counteract the tax benefit which would otherwise be obtained.

117. In *Vaccine Research Ltd Partnership v HMRC (and related appeals)* [2015] STC 179, the members of a Jersey limited partnership claimed research and development allowances for expenditure on vaccine research and development. They claimed loss relief totalling more than £192,000,000. HMRC rejected the claims, accepting that a Jersey company, which was a member of the partnership, had paid a subcontractor £14,000,000 on research and development, but considering that the partnership had not been trading and that the other partners were not entitled to the allowances which they had claimed. The partners appealed, contending that the Jersey company had been working for the partnership as a contractor. The First-tier Tribunal reviewed the evidence in detail and allowed their appeals in part but rejected the majority of the partners' claims for relief. Judge Williams held that only the £14,000,000 which the Jersey company had paid to the subcontractor could in law "be regarded as incurred on research and development". The other sums which the partners had contributed to the partnership had not been spent on research and development, and thus did not qualify for allowances. The Upper Tribunal upheld this decision.

118. Similarly, in *Brain Disorders Research Ltd Partnership and another v HMRC* [2018] STC 2382, a partnership had paid 100 (a hypothetical simple number) to a special purpose vehicle (SPV) to undertake research work. 100 was verified by a third party as the amount required to undertake the research conventionally. The SPV had then sub-contracted the work to a company which held the technology, expertise, systems and data bank to enable it to perform the work for a fraction of the price. The SPV had only paid 6 to its sub-contractor. A clause of the contract between the partnership and the SPV provided that the SPV "shall by itself or through the Appointed Sub-Contractor undertake for the partnership a programme of research work". The First-tier Tribunal observed that there was no intention that the SPV would or could undertake the project itself so that the first limb of the clause was false and it was the foundation of the partnership's claim for vastly excessive capital allowances. The transaction must therefore be struck down as a sham. Furthermore, applying the Capital Allowances Act 2001, section 437 purposively, and analysing the facts realistically, it was "absolutely impossible" to conclude that capital expenditure had been

incurred on any scientific research in any amount in excess of 6. The Upper Tribunal and the Court of Appeal upheld this decision.

119. The above two cases are examples of blatant tax avoidance schemes involving excessive claims of R&D allowances, which had been struck down by the court in the United Kingdom. While the Commissioner would not cast unnecessary inhibitions on normal commercial transactions by which enterprises legitimately take advantage of the R&D deduction regime, he would invoke general or specific anti-avoidance provisions to knock down blatant or abusive tax avoidance arrangements like those in such cases.

ADVANCE RULINGS

Ruling on specific R&D activity

120. Since R&D always involves a significant amount of investment, enterprises may want to know whether a prospective project would be considered as an R&D activity or a qualifying R&D activity before taking forward the project. To secure tax certainty, a request in respect of a specific R&D activity may be made to the Commissioner for a ruling on how the provisions under section 16B and Schedule 45 are to apply to the applicant. The Commissioner requires maximum disclosure for advance ruling applications and a fee needs to be paid. Departmental Interpretation and Practice Notes No. 31 explains the procedures and requirements for making advance ruling applications.

APPLICATION AND IMPLEMENTATION

Examples, illustrations and enquiry

121. Examples illustrating the principles on “qualifying R&D activity” can be found at Appendix 1 whereas application of those principles in software creation, FinTech and drug development can be found at Appendix 2. Enquiry and documentation requirements are set out in Appendix 3.

Principles Explained

Below examples and illustrations are designed to cast light on the principles explained in this Interpretation and Practice Note. They should be read within the context of a particular case and documentation records are required to substantiate any deduction claim for R&D expenditure.

	Examples and Illustrations
<p>1. The R&D process</p>	<p>1.1 An enterprise conducted extensive market research to learn what technical and design characteristics a new HD Blu-ray Player should have in order to be an appealing product. This work was not a qualifying R&D activity*. However, it did identify a potential project to create a HD Blu-ray Player incorporating a number of technological improvements which the enterprise’s R&D staff (who were competent professionals) regarded as genuine and non-trivial. This project would be seeking to develop a substantially improved HD Blu-ray Player.</p>
	<p>1.1.1 The enterprise then decided on a detailed specification for the desired new product, and devised a plan for developing it. Some elements of this plan involved planning of activities which directly contributed to achieving an advance in science or technology by resolving the project’s scientific or technological uncertainties (such as the system uncertainty associated with an improved control mechanism for the Blue-ray that reads the disc). This element of planning was a qualifying R&D activity, as were the activities themselves. Other elements of the plan focused on obtaining intellectual property protection or cosmetic design decisions, for example, which did not directly</p>

* It refers to “qualifying R&D activity” as defined in section 4 of Schedule 45 to the Ordinance.

	<p>contribute to resolving the project’s scientific or technological uncertainties and were therefore not qualifying R&D activities. Neither this planning nor these activities were qualifying R&D activities.</p>
	<p>1.1.2 The scientific or technological work culminated in the creation of a series of prototype HD Blu-ray Players, and ultimately a “final” prototype was produced and tested which possessed the essential characteristics of the intended product (built-in Wi-Fi and the smart TV interface, performance characteristics, etc.). All the activities which directly contributed to resolving the scientific or technological uncertainty of creating the HD Blu-ray Player up to this point (such as the testing of successive prototypes) were qualifying R&D activities.</p>
	<p>1.1.3 Several copies of this prototype were made (not a qualifying R&D activity) and distributed to a group of consumers to test their reactions (not a qualifying R&D activity). Some of these consumers reported concerns about the accidental failure of the Blue-ray Player. Additional work was done to resolve this problem. If this involved a routine adjustment of the existing prototype (i.e. no scientific or technological uncertainty), then it would not be a qualifying R&D activity; if it involved more substantial changes (i.e. there was scientific or technological uncertainty to resolve), then it would be a qualifying R&D activity.</p>
<p>2. Advance in science or technology</p>	<p>2.1 Searching for the molecular structures of possible new drugs would be an advance in science or technology, because it applies existing knowledge of science (which compounds are known to cause particular physiological effects) in search of new or improved active compounds. This is true even if the method used to search for those molecular structures (e.g. running a computer program on</p>

	<p>a particular set of data) is itself entirely routine. The activity directly contributes to the resolution of scientific or technological uncertainty and so would be a qualifying R&D activity. Work to identify new uses of existing compounds would also be creative work in science or technology, because it seeks new scientific knowledge about those molecules.</p>
	<p>2.2 An advance in science or technology need not imply an absolute improvement in the performance of a material, device, product, process, system or service. For example, the existence of high-fidelity audio equipment does not prevent a project to create lower-performance equipment from being an advance in science or technology (for instance, if it incorporated technological improvements leading to lower cost through more efficient circuit design or speaker construction).</p>
	<p>2.3 An enterprise was in the business of providing engineering services. It studied the feasibility of using a variable refrigerant volume (VRV) system to replace conventional air-handling unit (AHU)/ cooling tower system in a building. The design and development of VRV system (easily controlled and has 25% energy saving capabilities) was novel to the enterprise. Information available on public domain showed that VRV system was an existing technology and a 25% energy saving was easily achievable at the time of the commencement of the project. Since the project did not achieve an advance in science or technology, the project was not a qualifying R&D activity.</p>
<p>3. Scientific or technological uncertainty</p>	<p>3.1 An enterprise's project involved finding a new active ingredient for weed-killer (an advance in overall knowledge or capability in the particular field of science or technology), and developing a formula incorporating</p>

	<p>the new active ingredient for use in a commercial product. Both of these would constitute an advance in science or technology.</p>
	<p>3.1.1 In order to achieve this advance, a programme of investigation by computer to pick likely ingredients and the systematic testing of possible ingredients and products based on those “trial” ingredients was undertaken. The work involved the adaptation of existing software to tackle the specific problem, and product formulation and testing using established methods. This investigation and testing evaluated the weed-killing performance and other relevant characteristics of the formulations (e.g. toxicity to humans and wildlife, water solubility, adhesion to weeds, damage done to other plants). All of these activities would therefore be qualifying R&D activities.</p>
	<p>3.1.2 The enterprise also did work to assess what characteristics a new weed-killing product should have in order to appeal to consumers. This activity did not directly contribute to the resolution of scientific or technological uncertainty and was therefore not a qualifying R&D activity.</p>
	<p>3.2 An enterprise was in the electronics business. While it had been developing silver bonding wire, the industry preferred gold bonding wire, which was expensive. The enterprise carried out R&D to develop a new silver bonding wire with gold coating, which could be bonded onto different chip surfaces. There was no industrial standard on the optimal gold thickness to coat the bonding silver wire. Also, there was technical uncertainty as the methodology to coat the silver bonding wire was not readily available in the market. There was a gap between the desired outcome and the state of knowledge and technology at the time of commencement of the project. The enterprise carried out a range of activities</p>

	<p>to identify the requirement, characterise the wire, test and finalise the product, including:</p> <ul style="list-style-type: none"> (a) researching the optimum gold thickness and evaluating the coating material; (b) conducting several investigative studies and testing for the optimum gold thickness coating layer; and (c) conducting iterative experiments to test and ensure the consistency and reliability of the gold coating layer in high temperature. <p>Since the enterprise had achieved an advance in science or technology through resolution of scientific or technological uncertainty, the project was a qualifying R&D activity.</p>
	<p>3.3 A food manufacturing start-up wished to develop a lower fat ice-cream product but retain the creamy taste and profile of the ice-cream. At the commencement of the project, there was no information in the public domain (e.g. scientific journals, articles, published reports) on the process to replace the fat with complex carbohydrates to create a creamier ice-cream product. There was scientific or technological uncertainty which could not be readily resolved by competent professionals based on the then knowledge and information. The enterprise carried out numerous experiments on the use of alternative ingredients to replace fat and the application method such as heat, pressure and the mixing speed. Before the project was completed, it was noted that there were low fat and healthier choices of ice-cream in the market. Though the other competitors had successfully developed a low fat and healthier ice-cream product, the project carried out by the enterprise was a qualifying R&D</p>

	<p>activity since it sought to achieve an advance in science or technology which was not known at the beginning.</p>
	<p>3.4 A flour manufacturer aimed at developing an authentic premixed flour formulation for frying of seafood such as pawn, scallop and fish slice. The enterprise had to achieve the following objectives in its formulation and production process:</p> <ul style="list-style-type: none"> (a) light crispy texture; (b) golden yellow colour; (c) spiky surface pattern; and (d) thin and good adhesive coating. <p>To achieve the objectives, the enterprise researched the various types of modified starch, baking powder and other ingredients and also evaluated different brands of commercially available premixes. The enterprise formulated basic recipes and experimented various ingredients.</p> <p>This project just involved routine formulation to develop the premixed flour product. It was based on the existing technology and the enterprise was merely changing the concentration of the various components of an existing premix to produce the new mix. There was no scientific or technological uncertainty as the issues on ingredient interactions were known to a competent scientist or technologist. The project was not a qualifying R&D activity.</p>
	<p>3.5 A construction material maker wished to produce translucent concrete using plastic optical fibres. Existing</p>

	<p>products available in the market only used glass optical fibres. There were several potential advantages to using plastic optical fibres including high mechanical flexibility, low cost and the ability to monitor structural integrity in the concrete. At the time of the commencement of the project, competent professionals in the relevant field did not know much information about the properties of the new translucent concrete on the basis of the existing knowledge or experience without conducting experiments. The enterprise therefore conducted numerous experiments based on specific and clearly articulated hypotheses to investigate the effects of optical fibre ratios and distribution on the physical properties of the translucent concrete. There was scientific or technological uncertainty. The project was thus a qualifying R&D activity.</p>
	<p>3.6 Applying existing technology such as blockchain technology widely adopted in financial industry to real estate industry or well-developed information technology to build a smart city may not be a qualifying R&D activity. If the outcome can be anticipated and there is no scientific or technological uncertainty involved, it would not be regarded as a qualifying R&D activity by virtue of section (4)(2)(b) of Schedule 45 to the Ordinance. Nevertheless, in specific cases, it might qualify as an R&D activity eligible for 100% deduction under section (2)(d) of Schedule 45.</p>
<p>4. Direct contribution to the resolution of scientific or technological uncertainty</p>	<p>4.1 Work to compare the effectiveness of two possible designs for controlling part of a new manufacturing process would directly contribute to resolving the scientific or technological uncertainty inherent in the new process, and hence such work would be a qualifying R&D activity. But work to raise finance for the project, while indirectly contributing to the resolution of scientific or</p>

	<p>technological uncertainty (e.g. by paying for work), does not of itself help resolve the uncertainty, and hence is not a qualifying R&D activity. Human resources work to support the project does not directly contribute to the resolution of scientific or technological uncertainty and hence is also not a qualifying R&D activity. Other examples not considered as directly contributing to the resolution of scientific or technological uncertainty include drafting documents to publish or communicate research results and applying for registration of patents.</p>
	<p>4.2 Innovation is important in establishing whether a project is R&D. The identification of innovation is important to separate a project from business-as-usual activities. The following are examples of what may be considered as qualifying R&D activities and they must meet the definition for “qualifying R&D activity”:</p> <ul style="list-style-type: none"> (a) a deliberate search for new knowledge, intellectual property and know-how (i.e. it has to be “new” from a worldwide perspective); (b) results written up as part of a knowledge capture during or at the end of an R&D project; and (c) Freedom to Operate (FTO) search and analysis (i.e. searching patent literature for issued or pending patents, and obtaining a legal opinion as to whether a product, process or service may be considered to infringe any patents owned by others) as part of planning and scoping the R&D project at the commencement of the project.
<p>5. Testing as part of an R&D project</p>	<p>5.1 Scientific or technological testing and analysis which directly contributes to the resolution of scientific or technological uncertainty is a qualifying R&D activity.</p>

	<p>So if testing work is carried out as part of the development of a pilot plant, this would be a qualifying R&D activity, but once the design of the “final” pilot plant has been finalised and tested, any further testing would not be a qualifying R&D activity. However, if flaws in the design become apparent later on, then work to remedy them would be a qualifying R&D activity if they could not readily be resolved by a competent professional working in the field (in other words, if there is scientific or technological uncertainty around how to fix the problem).</p>
<p>6. Cosmetic and aesthetic effects</p>	<p>6.1 An enterprise was seeking to make a water-breathable fabric for use in hiking gear. A test fabric with the required physical characteristics was produced through a qualifying R&D activity. This new fabric was then produced in small quantities (not a qualifying R&D activity) and market tested with a number of trial users. The user tests were not qualifying R&D activities, because they were concerned with testing the commercial potential of the new material and assessing its appeal to users.</p>
	<p>6.1.1 One of the results of these tests was that users did not like the feel of the new fabric against their skin, and disliked its shiny appearance. The enterprise decided to investigate variants of its new fabric, which required significant changes to the material’s weave and physical structure, to overcome these problems. Because there was scientific and technological uncertainty around whether a material with the desired physical characteristics could be made, such investigation was a qualifying R&D activity.</p> <p>To what extent a change would be regarded as significant would depend on the facts of each case. The crux is</p>

	<p>whether competent professionals working in the field would accept that such change would involve scientific or technological uncertainty.</p>
<p>7. Project, prototype and end of an R&D project</p>	<p>7.1 An enterprise developed new spark plugs for use in an existing petrol engine. The scientific or technological uncertainty associated with this work was resolved once prototype plugs had been fully tested in the engine. The activities directly contributing to this work, including the construction of prototypes and their testing in the engine, would be qualifying R&D activities.</p>
	<p>7.1.1 The same enterprise decided to design a new engine to incorporate the new spark plugs, involving a new combustion chamber design, lighter materials and other improvements such that the overall engine was substantially improved (i.e. it used less petrol to achieve slightly greater power output performance, and generated less pollution than the existing models). The activities directly contributing to this work, including the design of the separate components (not all of which had to be different from those used in previous models) and their integration into a new engine, were qualifying R&D activities. The uncertainty associated with this work was resolved, and the qualifying R&D activities were complete once a functionally final prototype had been tested.</p>

**Application to Software Creation,
FinTech and Drug Development**

Creation of software

1. Where software is developed as a tool for direct use in a larger R&D project which constitutes a qualifying R&D activity*, then development of the software would be also part of the qualifying R&D activity. An example might be data handling software needed to record and monitor the results of the qualifying R&D activity. The software need not of itself involve a specific advance in science or technology. So long as the software directly contributes to a larger R&D project which is a qualifying R&D activity, the development of such software will also be a qualifying R&D activity.

2. Software applications or components of applications will normally follow established methodologies and not involve scientific or technological uncertainties. Thus, they would not be qualifying R&D activities. Examples are:

- (a) supporting, de-bugging or making minor improvements to existing computer software;
- (b) adaption of functions of commercially available software into a customised business application;
- (c) handling interactions with users (e.g. development of data entry procedures and user interface design);
- (d) arranging visual presentation of information to users such as dashboard creation;
- (e) creating a database;

* It refers to “qualifying R&D activity” as defined in section 4 of Schedule 45 to the Ordinance.

- (f) creating a software application that replicates an established paper procedure, possibly building in best practices (i.e. a previously manual task has been automated);
- (g) assembling data, carrying out routine operations on data and presenting data;
- (h) using standard methods of encryption, security verification and data integrity testing; and
- (i) creating websites or software using tools designed for that purpose.

However, where these contribute directly to a larger R&D project which constitutes a qualifying R&D activity, they would not be excluded from the larger R&D project.

3. The following software projects are likely qualifying R&D activities:

- (a) developing new operating systems or languages;
- (b) handling application program interfacing where unknown program interactions require new technical solutions;
- (c) creating new search engines using materially new search methods;
- (d) designing complex data capture and analysis tools that require new technical solutions;
- (e) resolving conflicts within hardware or software, where the existence of a problem area and the absence of a known solution have been documented;
- (f) creating new or more efficient algorithms whose improvements depend on previously untried techniques;

- (g) creating new encryption or security techniques that do not follow established methodologies; and
- (h) developing an artificial intelligence system with human-level reasoning capability.

4. Assembling components of a program to an established pattern or using routine methods for doing so would not be a qualifying R&D activity. Combining standard programming technologies can be a qualifying R&D activity if a competent professional in the field cannot readily deduce how the separate components should be combined to have the intended function.

5. There are always uncertainties involved with software development for a range of reasons. But uncertainties that can be resolved through discussions with peers or through established methods of analysis are routine design uncertainties rather than technological uncertainties. Technical problems that have been overcome in previous projects on similar operating systems, or computer architecture, are not technological uncertainties.

6. Routine testing steps in software development projects are not for the purpose of gaining new knowledge and resolving scientific or technological uncertainties. They tend to occur after the R&D experiments and address other project risks. Examples of these types of testing steps that are not qualifying R&D activities include:

- (a) bug testing;
- (b) beta testing;
- (c) user acceptance testing;
- (d) system testing;
- (e) requirements testing;
- (f) data mapping and data migration testing;

- (g) testing the efficiency of different algorithms that are already known to work; and
- (h) testing websites in operation by measuring the number of hits.

7. A large scale application software project typically entails the development of many sub-functions, components and interfaces. Scientific or technological uncertainties may affect only certain parts of the software project. Therefore, only those parts of the project may be considered as qualifying R&D activities. If, however, the uncertainties relate to the core functionalities developed for the software project, the whole project may be regarded as a qualifying R&D activity, provided that other criteria are fulfilled. Where a software development project includes only a few components that are highly interrelated and function as a whole, then the components would be evaluated as a whole since it is not feasible to evaluate each individual component separately. Detailed documentation of the scientific or technological uncertainties involved for each sub-function or component of a large scale application software project would help enterprises to distinguish or track the specific activities that are related to the parts considered as qualifying R&D activities.

8. In practice, the Assessor will likely request for further information on application software projects for the following reasons:

- (a) Substantive information is provided on the commercial objectives but sufficient information may not be provided on the scientific or technological objectives of the application software project (i.e. the scientific or technological uncertainties that enterprises seek to overcome). The risks frequently presented (such as schedule risks, unclear user requirements, inappropriate staffing, lack of documents on earlier systems, etc.) are not scientific or technological uncertainties.
- (b) Sufficient information is not provided on the studies in the field of science or technology conducted for the application software project.

- (c) The entire application software development project is wrongly assumed as a qualifying R&D activity without adequate explanation. There may be many components that constitute an application software and some of which are standard components commonly used in the IT industry (e.g. inventory management, standard imaging and authentication modules). More information is required to understand the basis for not taking out these standard components in a claim for deduction of R&D expenditure.
- (d) It is wrongly assumed that the complexity of the integration works in an application software project will qualify it as a qualifying R&D activity. While it is acknowledged that application software integration is often resource intensive and by no means an easy task, explanations are required to show clearly how the integration works meet the definition for “qualifying R&D activity”.
- (e) It is wrongly assumed that engaging a software firm to participate in the project means resolution of any problem will be a qualifying R&D activity. Since technical risk refers to specific scientific or technological uncertainty existing in the project that cannot be readily resolved by competent IT professionals, more information is required on the scope of engagement with the software firm and its areas of specialisation and experience in dealing with the particular technical problem to ascertain the technical risk.

Example 1

An enterprise developed a software intended for the analysis of market research data (not scientific or technological knowledge). No new algorithm which extended overall knowledge or capability in the field of software was created.

The development of the above software did not result in a scientific or technological advance in the field of software as a whole. As such, it would not be a qualifying R&D activity. Work to adapt

such software to analyse, for example, customer spending patterns, would also not be a qualifying R&D activity.

Example 2

An enterprise in the financial services sector embarked on a project to significantly improve the speed and accuracy of the decision making process of its trading platform for financial derivatives. There was no such trading platform available in the market that could dynamically process more than 50 specific trading parameters of the enterprise and reach an accurate decision in less than 30 seconds without upgrading the hardware. Though its R&D team had worked out a number of options, there remained uncertainty over the accuracy, reliability and speed of the output for each of the potential solutions. There was technological uncertainty which could not be readily resolved by a competent IT professional at the commencement of the project. The project involved researches into the following areas:

- (a) lightweight architecture supporting the execution of the high-speed data;*
- (b) identification of the various parameters and patterns for the algorithmic trading which was unique to the enterprise's decision making process;*
- (c) computations and rules framework;*
- (d) time critical query processing;*
- (e) smart ways to filter input data;*
- (f) speed and reliability of the execution;*
- (g) real time intelligence; and*
- (h) database management.*

Since the above R&D project sought to directly contribute to achieving an advance in science or technology by resolving scientific or technological uncertainty, it was a qualifying R&D activity.

Example 3

An insurance company started a project to automate its manual processes across the finance, treasury and human resources departments to improve productivity. The development went through many iterations of designs, coding, re-coding and testing due to the complexity of the business rules. Such activities were normal application development life cycles without any need to find out something that was not known or readily deducible.

As the above project did not involve scientific or technological uncertainty, it was not a qualifying R&D activity.

Example 4

In the course of review, a software developer noted that a new algorithm, but not the underlying program code, had been published in a technical journal. It planned to convert the new algorithm into program code so that a new software product could be put into market for sale.

Development of program code using a new algorithm already made known to the public should not be a qualifying R&D activity because conversion of an algorithm into program code would not involve any scientific or technological uncertainty.

FinTech

9. FinTech, the application of information technology to the provision of financial services, has surged in recent years, spurred by dramatic advances in technology along with post-crisis regulatory changes. The financial services sector has seen a new wave of participants, including FinTech start-ups as well as major e-commerce and technology firms, alongside incumbent financial institutions.

10. “FinTech” is a loose term embracing a wide range of applications of technology in the context of financial services, including offerings that change pre-existing models of the relationship between the financial service provider and the customer. The main segments of FinTech are generally regarded as: finance (including P2P (peer-to-peer) lending, crowdfunding), WealthTech/ InvestTech (investment advice and trading activities including robo-advisory) and InsureTech (insurance technology); payments and settlement; data (including analytics, monetisation and cybersecurity); customer interface (such as smartphone, social media and internet applications). RegTech (regulatory technology) and blockchain-related financial services impact and interact across all of these segments.

11. Many financial institutions and FinTech start-ups are undertaking FinTech projects. However, this does not necessarily mean that all such works are qualifying R&D activities. To be a qualifying R&D activity, a FinTech project must seek to directly contribute to achieving an advance in science or technology by resolving scientific or technological uncertainty. Since FinTech always involves application software development, what is mentioned above for software creation is also applicable to FinTech projects.

Example 5

A banking enterprise undertook an R&D project to develop a biometric authentication system based on heartbeat signals (i.e. electrocardiographic (ECG) signals) that could not be easily fraudulently replicated. At the time of commencement of the project, there was no such technology available in the market and whether a handy detection device with reliable feature extraction technique for recognising ECG signals remained uncertain.

Since scientific or technological uncertainty was involved, the above project was a qualifying R&D activity.

Example 6

An enterprise in the wealth management industry planned to develop a “robo investment advisor” using big data analytics and machine learning techniques for managing clients’ investment needs. The

“robo investment advisor” would be able to perform the following online tasks on a real time basis:

- (a) capturing data from various sources and analysing more than ten thousands of variables simultaneously;*
- (b) selecting individual securities (including stocks, bonds, debentures, derivatives, etc.) for building diversified investment portfolios for clients with different risk profiles and investment preferences;*
- (c) executing clients’ instructions and carrying out financial transactions for them;*
- (d) monitoring the financial performance of clients’ investment portfolios and making changes to them as appropriate; and*
- (e) interacting with clients and answering their enquiries.*

At the time of the commencement of the R&D project, there was no such technology in the market with an error rate of less than 0.1%. In the wealth management market, digital investment advice platforms usually offered mutual funds or exchange-traded funds to build investment portfolios, tracking an index or adopting a passive investment approach based on portfolio theory research. There remained a technological uncertainty for developing such a powerful tool which could possess human-level reasoning capacity and analyse the interactions of numerous variables.

The above project was a qualifying R&D activity since it would directly contribute to achieving an advance in technology.

Drug development

12. Enterprises in the pharmaceutical industry that undertake R&D into potential new drugs have to conform to the regulatory processes of the jurisdictions in which they wish to market the drug. There are four basic stages in pharmaceutical R&D which are summarised below:

- (a) Drug discovery – This is the earliest stage of the pharmaceutical research process, where potentially useful compounds (referred to as new chemical entities or NCEs) are identified. This stage involves drug synthesis, biological testing and toxicology studies. Developments such as “high throughput screening” (robotic screening systems that check thousands of molecules per day for particular characteristics) have aided this process tremendously. The process may involve searching huge “libraries” of compounds for any that might have helpful biological activity. Researchers can then select compounds for further testing.

- (b) Preclinical development – This stage involves the initial development of candidate NCEs. The NCE will be the subject of further laboratory tests in vitro and on live animal subjects, to further establish its properties and effects. The enterprise will be planning how it is to test and trial the NCE, how it is to source any substances it needs to produce sufficient quantities of the compound for trials, and how it is to approach the regulatory authorities. It will establish a structured and managed plan to test the compound and to present the compound test data and report findings at the most optimal time and in the most appropriate format. At this point, pharmaceutical enterprises usually give NCEs a code name prior to selecting a brand name.

- (c) Clinical development – Clinical trials are initiated when an NCE identified from laboratory research shows promise as a therapeutic intervention. Such potential drugs are tested on human subjects. This takes place in three stages. Phase I to III clinical trials are necessary before a medicine can be licensed as safe, effective and of good quality by many regulators, for example, the MCA (Medicines Control Agency of the United Kingdom), EMEA (European Medicines Evaluation Agency of the European Union) or FDA (Food & Drugs Administration of the United States). They are described as follows:

- (i) Phase I strategic work is often referred to as “situation analysis”. Investigations are conducted into how the drug is absorbed, how it is distributed to tissues, how it is metabolised and how it is excreted. This is assessed by administration to small numbers of healthy volunteers. This stage establishes the maximum non-toxic dose levels and the most common adverse events.

- (ii) Phase II intends to assess preliminary efficacy evaluations in small numbers of patients suffering from the target disease or condition. It establishes the dose-response effect, further common adverse events and a benefit/risk assessment. Key strategic marketing decisions and early branding work also commence at this point. Evaluation of data from the R&D, commercial and marketing teams culminates in the formulation of the product profile and strategic summary documents. Brand name research and logo development takes place towards the end of phase II and continues into Phase III.

- (iii) Phase III is the largest definitive investigation and involves comparative efficacy and tolerability studies in a large number of patients suffering from the target disease. Concurrent marketing analysis is conducted and concentrates around developing the brand character, the value proposition and early positioning work. Many other programmes, such as pricing, packaging and sales pitch, are decided at this time. Creative development strategy and concept testing is completed just prior to launch. As the largest of the pre-registration studies, Phase III trials consume the most resources, often employing armies of investigators and monitors. It is largely on the results of Phase III studies that the efficacy and tolerability profile of a new drug is established. Regulatory dossiers are compiled containing chemical, pharmaceutical and biological

documentation, results from Phase I to III trials and special particulars relating to the drug. Once the dossier is filed with the licensing authority, a decision may take some time especially if the regulatory authority requests clarification, further data and/or an audit of investigational sites and procedures.

- (iv) Between the time of filing and the granting of a product licence, further clinical trials may be required. These trials are sometimes described as “Phase IIIb” (post-submission but pre-registration). When the product licence is granted, the drug can be launched and marketed to prescribers.

- (d) Post launch – Phase IV clinical trials occur once a product has been licensed. A medicine may cause as yet unknown side effects that are only recognised in such instances; similarly, a medicine may cause previously unknown effects by interaction with other medicines. Thus, Phase IV clinical trial involves post-marketing confirmatory studies; special interest studies in patient subgroups; longer-term efficacy, tolerability and safety profile assessment; further comparative studies; and monitoring of adverse events in widespread use. Studies of a product will continue throughout its life, focusing on customer and prescriber issues such as positioning, behaviour, perception, satisfaction and loyalty.

13. It seems to be the case that the research activities of discovery, pre-clinical development as well as Phase I and II clinical trials will usually be concerned with the resolution of scientific or technological uncertainty, but that Phase IV clinical trials will not. Experience has shown that this is generally an appropriate starting point for examination of R&D deduction claims from pharmaceutical enterprises. But if there are unusual circumstances meaning a qualifying R&D activity is done in Phase IV clinical trials, or not done in some elements of Phase I and II clinical trials, then this can be examined further.

14. For some drug development cases, Phase III clinical trials may also involve resolution of scientific or technological uncertainty. If this is the case,

Phase III clinical trials can also be regarded as a qualifying R&D activity. What is important with every deduction claim is that the enterprise can demonstrate by reference to what it has actually done that the expenditure is incurred on a qualifying R&D activity.

15. Some of the work within the phases will not qualify for enhanced deduction. For example, the brand name research and logo development work referred to in the description of the Phases above is clearly not a part of the resolution of the scientific uncertainty.

16. Enterprises can produce generic versions of existing drugs that are losing patent protection. They may only need to demonstrate that their product shows bio-equivalence and has equal clinical safety to the existing product. This will not have the same uncertainties to resolve. Such work is not a qualifying R&D activity.

17. Clinical trials involve the testing of the drug in both healthy patients and patients with the target disease or condition. Pharmaceutical enterprises will often make payments to people volunteering to take part in clinical trials. Trials are conducted under ethical guidelines and the nature of the trials and what is expected of the volunteers will be fully explained to them and documented. It should be noted that such payments are not qualifying expenditure since clinical trial volunteers are not employees of the enterprises. Nor do such payments fall within the definition of consumable item under section 12(5) of Schedule 45 to the Ordinance. These payments can only be eligible for 100% deduction as Type A expenditure.

Enquiry into a Claim for R&D Expenditure

Approach of enquiry

1. The Assessor would be sympathetic and supportive when dealing with queries from enterprises or when making enquiries into their claims for deduction of R&D expenditure. In return, enterprises are expected to be open and clear about their R&D activities and to be helpful and co-operative if the Assessor has any queries concerning their claims.

2. The enhanced deduction for R&D expenditure is intended to encourage investments in innovation. For some enterprises, particularly small start-up enterprises, the cash flow resulting from the tax concession can make an important difference. Claims for enhanced deduction would be dealt with quickly for such enterprises. Where an enquiry has been opened without accepting the claim in full, the Assessor would keep under review whether it is possible to accept a claim at least partially.

3. Some of the risk factors the Assessor may consider when examining a claim for deduction of R&D expenditure and the sorts of records the Assessor may wish to examine are discussed in paragraphs below.

4. When asking questions about a claim, the size of the enterprise and the nature of its trade would be taken into account. Any enterprise making a claim for deduction of R&D expenditure should be expected to be proud of the product and care would be taken not to belittle its efforts in communications. An open-minded approach would be adopted as to whether a project, or part of a project, is a qualifying R&D activity*. The Assessor will gather all of the facts, and listen to the enterprise's representations before making a decision. The aim is to test the information provided against the relevant provisions in section 16B and Schedule 45 to the Ordinance. Although not all of the following questions would be applicable in every case, the Assessor would normally ask the enterprise to explain in plain language:

* It refers to "qualifying R&D activity" as defined in section 4 of Schedule 45 to the Ordinance.

- (a) what was the advance in science or technology that was being sought;
- (b) what the R&D project was, and if relevant, what the larger commercial project was;
- (c) the particular scientific or technological uncertainties that needed to be resolved to seek the advance;
- (d) in what way does the project go beyond what was the current state of knowledge;
- (e) why the knowledge or capability sought was not readily deducible by a competent professional in the field;
- (f) when the particular uncertainties were overcome;
- (g) what activities within the project fall within the statutory definition of “R&D activity” or “qualifying R&D activity” for tax purposes.

Judicial guidance on claims

5. There is some judicial guidance on how to prepare an R&D deduction claim in *BE Studios Ltd v Smith & Williamson Ltd* [2006] STC 358. Mr. Justice Evans-Lombe accepted that assuming that all the enterprise’s activities were R&D, and then knocking out specific disallowable activities such as marketing, was an “entirely inappropriate” approach to preparing the claim.

6. Mr. Justice Evans-Lombe said that the provisions of the relevant financial reporting standard acted as a “gateway” through which all claims must pass to be allowable. The correct approach to preparing a claim was to read the guidelines (i.e. Guidelines issued by the UK Secretary of State for Trade and Industry on section 837A of the Income and Corporation Taxes Act 1988) and the legislation, to refer to the documentation and to consult with the people undertaking the work.

7. Mr. Justice Evans-Lombe stressed the need to identify any scientific or technological uncertainties and quantify the expenditure on seeking to resolve these. He made clear that there had to be sufficient evidence that the enterprise was engaged in an R&D project, and which employees were so engaged, and for what proportion of their working time. He also indicated that oral evidence might be acceptable in the absence of full written records.

Conduct of enquiry

8. All claims for deduction of R&D expenditure are subject to a risk assessment process. The overall objective of any enquiry will be to ensure that the enterprise is in receipt of the correct amount of deduction or enhanced deduction and that the correct amount of profits tax is charged. After the enquiry, the enterprise will, if necessary, be advised on how to improve the content and accuracy of its claim and any claims for later years.

9. During the course of an enquiry into a claim for deduction of R&D expenditure, the Assessor will request the information needed to confirm that the enterprise is undertaking an R&D activity or a qualifying R&D activity as defined and claiming the correct amount of deduction for R&D expenditure. The Assessor may make arrangements to visit the premises of the enterprise, if required, to discuss the claim with the enterprise's management and technical experts.

10. The requirements for the production of records will be kept to the minimum compatible with reasonable assurance. To this end, the Assessor will aim to ask for all necessary information as early in the enquiry as possible. However, it may be necessary to request additional information if new issues emerge during the course of an enquiry.

11. The Assessor handling the enterprise's profits tax matters will not hold himself out to be a scientific or technological expert. However, where appropriate, he will need to ask questions of the enterprise's technical experts to establish their scientific or technological background and that they understand and have correctly applied the definition of qualifying R&D activity.

12. Every officer appointed under, or employed to carry out the provisions of, the Ordinance has to observe the secrecy provision under section 4. All information and documents collected in ascertaining an enterprise's deduction claim would not be disclosed to any other person except in the performance of duties under the Ordinance.

13. The Assessor will keep enterprises informed of the progress of the enquiry. If at any stage an enterprise feels that it has not been informed, it can contact the relevant section head who will explain what is happening and what the next steps towards resolving the enquiry are.

Risk assessment process

14. There are some risk factors that are of particular relevance when considering the claim:

- (a) If there is no analysis of how the amount of deduction claimed has been arrived at, it is harder to be sure whether it is correct. It may include arithmetic or typographic errors, fail to meet the qualifying conditions, or it may be subject to some common errors.
- (b) The nature of the trade may mean that it is more important to consider whether the activity constitutes a qualifying R&D activity. In some cases, it will be less obvious how scientific or technological uncertainty would be involved in projects that would be relevant to a particular trade. Where the project is seeking an advance in the field of the arts, humanities or social sciences (including economics), it will not come within the definition of science, and so it will be necessary to examine the means of pursuing it to see if it incorporates a scientific or technological advance.
- (c) The activity may not be a qualifying R&D activity even if it is so classified by the accountant when drawing up the accounts of the enterprise. For accountancy purposes, a wider range of expenditure can be included as R&D expenditure than is

the case for the purposes of the enhanced deduction claim, though the expenditure relating to an R&D activity may be eligible for 100% deduction.

- (d) The absence of an R&D disclosure in the accounts should not be taken as necessarily meaning that there is an absence of qualifying R&D activity. The requirement is that the activity falls within the meaning of qualifying R&D activity, whether or not it is actually disclosed as such.

R&D records

15. Enterprises are required to keep sufficient records to substantiate their claims for deduction of R&D expenditure. There is a difference between making an unexpected discovery and the carrying out of a qualifying R&D activity. For there to be a qualifying R&D activity, there needs to be a systematic project seeking to achieve an advance in science or technology through resolution of scientific or technological uncertainties. The records kept by individual enterprises may vary. Larger enterprises with more than one project would be expected to have a more structured approach to record keeping than might be the case for small start-up enterprises undertaking their first R&D project. But it is in the nature of a qualifying R&D activity that it should be conducted systematically, and this should leave its trace in the records available.

16. For a qualifying R&D activity, enterprises would commonly be expected to have some form of project planning material that may cover:

- (a) What the R&D objective of the project is – That is, what advance in science or technology is being sought. This would be expected to include references to the current state of knowledge and/or technology and indicate what scientific or technological hurdles have to be overcome to achieve the desired advance.
- (b) A link between the outcome of the R&D project and its effect on the commercial prospects for the enterprise – In order to meet the “related to the trade” test, one would expect to see

the R&D project (or the larger commercial project in which it is embedded) considered in terms of its benefit to the enterprise.

- (c) A review of the current state of knowledge – One cannot be prescriptive about what form this would take but it might include any patent searches, reviews of the scientific or technological aspects of competitor products, and trade journal or scientific articles which indicate the state of knowledge and advancement in the particular sector, technology or trade. Such review or searches must be properly documented so as to establish the state of knowledge.
- (d) What difficulties are foreseen for the project – This would include a review of the scientific or technological uncertainties (not just “we do not know if it could work” but an indication of the specific areas of scientific or technological uncertainty that would have to be resolved in the context of the current state of scientific or technological knowledge in the field).
- (e) A structure for the project setting out the activities, design of experiments, who will undertake them, and what the stages are that need to be achieved to get the desired result.
- (f) Notes on the particular expertise specific employees, consultants or subcontractors will bring to the project, why they have been selected and what they are expected to do.

17. As the project develops, the enterprise should also keep the following:

- (a) Notes on how the uncertainties and other challenges were overcome or not, including laboratory notes and project records showing the activities undertaken, step-by-step procedures, measurement of outcome and outcome, test protocols, test results, records of trial runs, successful or unsuccessful attempts, analysis and conclusions, prototypes or samples developed, etc.

- (b) Information about any major changes to the objectives, or new uncertainties that have been encountered.
- (c) Details of any patent applications filed, or how any resultant, identified intellectual property is to be protected.
- (d) Internal progress reports and minutes of project meetings.

18. However, particularly for small enterprises, not all of the above may be formally documented. So the Assessor would be prepared to consider other relevant contemporary evidence that is available.

19. Besides, enterprises are required to keep the following R&D expenditure records to support their claims:

Outsourced R&D activities

- (a) agreements or contracts entered into with the R&D institutions;
- (b) evidence of the payments made to the R&D institutions, such as bank deposit slips, invoices and receipts;

In-house R&D activities

- (c) list of R&D staff with details on their qualifications and professional competence;
- (d) employment contracts for R&D staff;
- (e) payroll records like payroll slips, retirement fund contribution statements;
- (f) timesheets for R&D staff who do not work full time on the R&D project;
- (g) invoices or receipts for consumable items purchased;

- (h) evidence, such as internal cost accounting codes, showing that the staffing costs and consumable items were properly charged to the R&D project;
- (i) In case freelanced R&D workers or R&D staff provider was engaged, contracts or agreements entered into with them, invoices received, bank payment records, details of the activities carried out by them and any evidence of active supervision by the enterprise.

20. Where the enterprise has obtained funding to undertake the project, it will often have set out details of the aim of its project for the funders. The enterprise's other publicity material may give similar information. While this type of material is generally useful background information that will help the Assessor to understand the context, it is, however, likely to focus on the final product, and its degree of innovation and customer appeal, rather than concentrating on the scientific or technological uncertainties. A unique product is not necessarily the result of a qualifying R&D activity. It can be commercially unique without constituting or involving scientific or technological advances. Because of this, the background material is rarely conclusive evidence that there is a qualifying R&D activity for the purposes of the tax concession, but it will help identify the project and consider it in its proper context.

21. In cases where the background material shows that a final product is deliverable in a short timescale, this may be indicative that there was not the required element of scientific or technological uncertainty needing to be resolved.

22. A project funded under the Innovation and Technology Fund (ITF), which is administered by Innovation and Technology Commission, may not necessarily be a qualifying R&D activity since the eligibility criteria for funding under the ITF are different from the requirements set out in section 16B and Schedule 45 to the Ordinance. Therefore, an enterprise must keep sufficient documentation to support its deduction claims under section 16B.

Information for cost contribution arrangements

23. In relation to a deduction claim for R&D expenditure incurred under a cost contribution arrangement (CCA), the following information would be relevant and useful:

Terms of the CCA

- (a) a list of participating associated enterprises;
- (b) a list of any other associated enterprises that will be involved with the R&D activity or qualifying R&D activity under the CCA or that are expected to exploit or use the results of the subject activity;
- (c) the scope of the activity and specific project covered by the CCA, and how the activity is managed and controlled;
- (d) the duration of the arrangement;
- (e) the manner in which participants' proportionate shares of expected benefits are measured, and any projections used in this determination;
- (f) the manner in which any future benefits, such as intangibles, are expected to be exploited;
- (g) the form and value of each participant's initial contributions, and a detailed description of how the value of initial and ongoing contributions is determined, including any budgeted versus actual adjustments, and how accounting principles are applied consistently to all participants in determining expenditures and the value of contributions;
- (h) the anticipated allocation of responsibilities and tasks, and the mechanisms for managing and controlling those responsibilities and tasks, in particular, those relating to the development, enhancement, maintenance, protection or

exploitation of intangibles or tangible assets used in the R&D activity or qualifying R&D activity under the CCA;

- (i) the procedures for and consequences of a participant entering or withdrawing from the CCA and the termination of the CCA;
- (j) any provisions for balancing payments or for adjusting the terms of the arrangement to reflect changes in economic circumstances;

Duration of the CCA

- (k) any change to the arrangement (e.g. in terms, participants, subject activity), and the consequences of such change;
- (l) a comparison between projections used to determine the share of expected benefits from the R&D activity or qualifying R&D activity under the CCA with the actual share of benefits; and
- (m) the annual expenditure incurred in conducting the R&D activity or qualifying R&D activity under the CCA, the form and value of each participant's contributions made during the CCA's term, and a detailed description of how the value of contributions is determined.

24. The Assessor is expected to be provided with a copy of the CCA agreement and annual CCA transfer pricing audit report during the course of an enquiry.