Valuing SOLAR ENERGY

PART 2

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Engaging individuals, property owners and communities in generating clean energy to sell to the grid is a win-win for everyone. Cleaner energy, contributing to the greenness of the planet and getting paid to do it – it does not get much better than this. Drawing from the microFIT and FIT programs in Ontario, this two-part article discusses the program participants' obligations, how solar panel improvements under the program are financed and assessed, and the challenges in valuing long-term photovoltaic (PV)/solar contracts on residential and non-residential properties.

NOTE: *Part I of this article, which discussed the participant's obligations as well as how solar panel improvements under the program are financed and assessed, appeared in* Canadian Property Valuation, *Volume 60, Book 1, published in March of 2016. It can also be viewed on the Appraisal Institute of Canada's Online Library at* http://www.aicanada.ca/article/Valuing-Solar-Energy-Part1-English

Part 2 in this issue deals with how these systems are valued and what the practitioner's obligations are under CUSPAP.

How they are valued and the practitioner's obligations under *CUSPAP*

Is it a scope issue or a scope opportunity? The first question that gets asked is whether this type of assignment is within the scope of the CRA designation or if it must be cosigned by an AACI. Solar systems are income-producing improvements that can be mounted on both residential and non-residential properties. For any residential property that falls within the scope of the CRA designation of up to four dwellings units or residential land for development, a CRA-designated member can sign the report without a co-signature. Any property beyond this scope requires the co-signature of an AACI.

The solar system generates an income stream over a period of 20 years. Because the income stream will vary and decrease over the life expectancy of the panels, the discounted cash flow (DCF) methodology must be applied. The DCF is not a commonly applied methodology

for those whose practice focuses largely on residential properties, but that does not mean it cannot be learned.

As with any assignment, *Ethics Standard Rule 4.2.7*[1] reminds us that it is unethical for a member to undertake an assignment lacking the necessary competence. Competence can be gained through knowledge, skills and/or experience. Practitioners will want to align themselves with subject matter experts, peers and industry professionals, and research the program to understand its intricacies and complexities.

CUSPAP requires the practitioner to provide a definition of value. Market value is the most probable price that a property should bring in a competitive and open market as of the specified date under all conditions requisite to a fair sale, with the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition and concepts with which we are all familiar are the consummation of a sale as of the specified date and the passing of title from seller to buyer under conditions whereby:

- buyer and seller are typically motivated;
- **both parties are well informed or well advised, and acting in what they consider to be their best interests;**
- a reasonable time is allowed for exposure in the open market;
- payment is made in terms of cash in Canadian dollars or in terms of financial arrangements comparable thereto; and
- the price represents the normal consideration for the property sold, unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.

Simple enough. A definition that is near and dear, but we need to understand its implications. Through the literature review, I came across an article that had a specific focus on the second bullet and brought an interesting perspective. As I interviewed program participants, a common theme emerged: they are well researched and well versed on the program, products and anticipated return on their investment. This is where the need for competence becomes important; the practitioner must ensure that he or she knows as much if not more about the program and product than the participants themselves. '**Don't know' or 'don't know how' does not equal $0 contributory value.**

Scope of work

Intrinsic to this assignment is the identification and definition of scope of work. It is important to explain to the reader whether or not the income-producing solar component of the property is included or excluded in the value conclusion and, if excluded, a rationale should be provided. Depending on when the system was installed, if the assignment is retrospective, the effective date of the assignment could pre-date the system, which would require its exclusion.

Regardless of whether the property is residential or non-residential, the practitioner may encounter different scenarios/client requests such as: market value with a system, market value without a system (i.e., property with existing system: 'as is' with system, 'as if system is excluded'; property without a system: 'as is without system', 'as if system is included or installed'). Members are reminded that 'as if' scenarios require hypothetical conditions and extraordinary assumptions.

Land use controls

Fundamental to highest and best use analyses is the requirement to identify and define land use controls as they may favor or hinder the addition of PV improvements to a property (i.e., current zoning designations and possible requirements for changes in classifications for solar improvements, permitted uses, set-back requirements).

The following *Appraisal Standard Rules* (*ASR*) and their relevant Comments should be well applied to ensure that the reader/intended user has sufficient information to, under the analyses, opinions and conclusions:

- ASR 6.2.15: **describe and analyze all data relevant** to the assignment;
- ASR 6.2.16: **describe and apply the appraisal procedures** relevant to the assignment and **support the reason for the exclusion of any** of the usual valuation procedures;
- ASR 6.2.17: **detail the reasoning** supporting the analyses, opinions and conclusions of each valuation approach;
- ASR 6.2.18: **analyze the effect on value, if any, of the terms and conditions of the lease(s)** when developing an opinion of the value of a leased fee or a leasehold estate; and
- ASR 6.2.23: review and **reconcile the data, analyses and conclusions** of each valuation approach into a final value estimate.

Developing the DCF

Fundamental to this type of assignment are the requirements to:

- understand the market for the property type under review to understand the level of market acceptance (or lack thereof);
- read and understand the contract (and that is not only for the microFIT or FIT programs);
- understand how PV systems are assessed and financed to determine what, if any, adjustments are required in the analysis;
- understand and define the technical language of PV systems as it pertains to the analysis; and
- fully scope out the assumptions and any limiting conditions.

The following are key terms that must be considered as part of developing the operating expense stream over the 20-year contract period. The practitioner will want to consider the valuation literacy of the reader/intended user, as this can be more technical than a typical appraisal assignment; having a glossary of terms in the report would be a recommended practice.

- **Generation fee:** fee charged by the utility company to run the system from the separate meter through the grid.
- **Derate factor:** the loss resulting from the conversion process of capturing the solar energy to converting into electricity. Losses increase as panels age and lose their utility (i.e., 0.5-1%/year); data and trends can be obtained from utility companies.
- **Degradation factor:** the annual loss in power output/depreciation rate of the solar system over its life expectancy (i.e. 0.5%-1% per year); data and trends can be obtained from solar professionals/dealers.

Defining the knowns and unknowns

Known:

- Initial/installation cost
- No value at reversion (i.e., no resale value)
- Timing of cash flow is monthly and over a determined period of time (i.e., 20-year contract)
- Fixed contract rate for the duration of the contract
- Historical solar production of the system if existing (i.e., utility bills from owner, solar suppliers)
- The sun comes up every day. Even if it is not always bright and sunny there is always solar activity. Photovoltaic Potential and Solar Resource Maps of Canada from Natural Resources Canada can be referenced to estimate the solar activity in cities across the country.

Unknown:

- The capacity/production of the system if new; requires industry/market data analysis (i.e., from solar suppliers, solar maps from Natural Resources Canada)

At the core of this type of assignment is the need to nail down the assumptions and any limiting conditions as this will assist in defining the income stream and operating expenses over the 20-year contract period. Here are some of the key assumptions and definitions to consider:

- The 20-year government-backed contract (with Independent Electricity System Operation or contract firm) will remain in place.
- Life expectancy of the panels is 20 years (or per industry) and, at the end of the 20 years, a new agreement will be required or the system will be removed, therefore, no residual value at the reversion.
- Derate factor: loss due to conversion will be X% per year
- Degradation factor: loss is production capacity will be X% per year
- Fixed costs will increase by X% per year (i.e., generation fee, insurance, maintenance (based on benchmark indices or market data))
- Property insurance will be in place for 20 years

Resolving the valuation problem: developing the discounted cash flow

Estimate the gross potential annual income over 20 years (life of the contract)

Less: power outage	Are certain assumptions required?

Effective gross income (EGI)

Annual operating expenses:

Year 1	initial installation cost
Subsequent years	may have capital expenses (CCA) that can be deducted
Generation fee	charged by the utility company
Derate factor	typically 0.5%-1% per year
Degradation factor	typically 0.5%-1% per year
Insurance	inflation index
Maintenance	% of EGI, may vary over time at key milestones of life of asset (i.e., roof replacement if shingled)

Capital expenses, land lease costs, other

Total expenses

Net cash flow before debt service

Valuation methodologies and extracting a discount rate

Direct comparison approach

While this is the most common methodology for residential properties, the lack of data (resales, paired sales of similar properties with PV systems, demonstrated purchaser behaviour and market acceptance for existing PV systems) is the biggest challenge.

This is also common to all property types. While the program has been in place since 2009, from a transactional perspective, market data in Ontario remains limited, and, in some markets, non-existent.

The direct comparison approach, applied on its own, is not considered as the most reliable unless there is strong market data.

Cost approach

This methodology is an important consideration with owned projects and is most relevant when the PV system is new, since it recognizes the un-depreciated up-front cost of the system. The replacement costs are fairly uniform. External obsolescence is difficult to estimate and, as noted, the panels depreciate quickly in the first 10 years.

Income approach

This approach plays an important role, given the fixed contract in place and the income stream. Extracting a discount rate is a challenge where minimal market data is available. On the one side, discount rates can be competitive in light of the guaranteed government-backed contract, the relatively high and steady income available, the guarantee that the sun will rise every day, and the sufficient market data to support the life expectancy estimates of the systems. On the flip side, a risk premium may be a consideration because of the unpredictability of mother nature, the unknown economic life of the project, possible stigma, the overall risk of owner management (if applicable), equipment failure and weather variations.

When the property owner leases their solar PV system (rooftop or

ground-mounted) to a third party, the lease becomes an encumbrance on the property. The onus is on the practitioner to review and understand the leases to ensure that the 'new tenant' will not be detrimental to the existing leases/tenants and/or their businesses.

When considering discount rates, the practitioner may want to consider realistic rates of return on similar income-producing investments with similar timelines or investment periods.

When valuing residential properties, the practitioner may need to look at resales and paired sales to determine the amount of premium the market is willing to recognize.

For non-residential properties, there is likely insufficient market data (resales) to illustrate a market discount rate to yield the value added by the microFIT or FIT program systems on the property. Multiple income streams with an income-producing property will make it even more difficult to extract the contributory value of the solar PV system from sales. Developing a sensitivity analysis demonstrating the impact of low, medium and high rates may assist in developing a range of values to reconcile.

Last, but not least, one should not overlook the importance of drafting Letters of Engagement – not just for these types of assignments, but any assignment. A Letter of Engagement is the opportunity to outline the expectations of an assignment, by both the practitioner and the client. This can be in the form of documentation to be provided and by whom, whether the PV system is to be included or excluded from the valuation assignment, and other particularities. For assignments such as this one, key documents are required from the property owner, such as a copy of the contract; installation costs, budgets or invoices; utility bills of the system (if existing); copy of the property insurance policy; and any other supporting documentation. A Letter of Engagement, signed by both parties, creates an opportunity to outline the fee, an invoicing schedule and any other information to which the client and the practitioner agree.

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For more information or questions on this topic, please contact Nathalie Roy-Patenaude, AACI, P.App, Director-Counsellor, Professional Practice at *directorprofessionalpractice@aicanada.ca* or at 1-866-726-5996.

End Note

1 At time of printing, *CUSPAP 2014* was still in effect therefore, the references in this article refer to *CUSPAP 2014*. All assignments completed on or after May 1, 2016 must comply with *CUSPAP 2016*.