

**Principles for Financial Market Infrastructures  
(PFMIs) Quantitative Disclosure  
As of December 31, 2017**

---

This disclosure can also be found at [www.ngx.com](http://www.ngx.com). For further information, please contact [clearing@ngx.com](mailto:clearing@ngx.com) or (403) 974-1700



TABLE OF CONTENTS

Principle 4: Credit Risk ..... 4

Principle 5: Collateral ..... 7

Principle 6: Margin ..... 7

Principle 7: Liquidity Risk ..... 12

Principle 12: Exchange-of-Value Settlement Systems ..... 13

Principle 13: Participant-Default Rules and Procedures ..... 14

Principle 14: Segregation and Portability ..... 14

Principle 15: General Business Risk ..... 14

Principle 16: Custody and Investment Risks ..... 15

Principle 17: Operational Risk ..... 17

Principle 18: Access and Participation Requirements ..... 18

Principle 19: Tiered Participation Arrangements ..... 19

Principle 20: FMI Links ..... 20

Principle 23: Disclosure of Rules, Key Procedures, and Market Data ..... 20

**Observance of CPSS-IOSCO PFMI**



*All values stated within these disclosures are Canadian currency and converted to such using the Bank of Canada noon day rate as at the end of the quarter, unless otherwise stated. The CDN/USD rate was 1.2545 as at December 31, 2017.*

<b>Principle 4: Credit Risk</b>	
<p><b>Principle 4.1</b> – Total value of default resources (excluding initial and retained variation margin), split by clearing service if default funds are segregated by clearing service, split by:</p> <ul style="list-style-type: none"> <li>(a) pre-funded                             <ul style="list-style-type: none"> <li>i) own capital that forms part of the default waterfall (further split by whether used before, alongside, or after, member contributions)</li> <li>ii) aggregate participant contributions (both amount required and post-haircut amount posted, where different)</li> <li>iii) other</li> </ul> </li> <li>(b) committed                             <ul style="list-style-type: none"> <li>i) own/parent funds that are committed to address a participant default (or round of participant defaults)</li> <li>ii) aggregate participant commitments to address an initial participant default (or initial round of participant defaults)</li> <li>iii) aggregate participant commitments to replenish the default fund to deal with a subsequent participant default (or round of participant defaults) after the initial participant default (or round of participant defaults) has been addressed</li> <li>iv) other</li> </ul> </li> </ul>	
<p>Total Value of NGX’s default resources as at December 31, 2017: CAD \$2,524.4MM</p> <ul style="list-style-type: none"> <li>a) Pre-funded                             <ul style="list-style-type: none"> <li>• NGX Capital: CAD \$41.1MM (used after defaulting Contracting Party collateral)</li> <li>• Contracting Party Collateral: CAD \$2,379.3MM</li> </ul> </li> <li>b) Committed                             <ul style="list-style-type: none"> <li>• Export Development Canada Default Insurance: CAD \$104.0MM (maximum liability USD \$100.0MM, first loss deductible USD \$15.0MM, value adjusted for deductible and potential liquidity risk)</li> </ul> </li> </ul>	
<p><b>Principle 4.2</b> – Kccp.</p> <p>NGX is a CCP with a self-funded default fund and does not require default fund contributions from its members; both the default fund contribution by clearing members and the associated capital costs of such contribution is currently zero. Basel III rules do not require QCCPs to be mutualized nor do they require QCCPs to have mutualized default funds. Given the certainty of the outcome of the capital cost calculation and the permissibility of NGX’s non-mutualized structure under the Basel III rules, NGX has determined it satisfies the QCCP criteria without the Kccp value.</p>	
<p><b>Principle 4.3</b> – Value of pre-funded default resources (excluding initial and retained variation margin) held for each clearing service, in total and split by:</p> <ul style="list-style-type: none"> <li>• Cash deposited at a central bank of issue of the currency concerned</li> <li>• Cash deposited at other central banks</li> <li>• Secured cash deposited at commercial banks (including reverse repo)</li> <li>• Unsecured cash deposited at commercial banks</li> </ul>	

- Non-cash
  - o sovereign government bonds
    - domestic
    - other
  - o agency bonds
  - o state/municipal bonds
  - o corporate bonds
  - o equities
  - o commodities
    - gold
    - other (please describe)
  - o mutual funds / UCITs
  - o other

Amounts should be reported both pre-haircut (i.e., at market value) and at post-haircut value.

The value of NGX's pre-funded default funds as at December 31, 2017 was CAD \$2,427.5MM consisting of the items shown in Principle 4.1(a) above.

- Secured cash deposited at commercial banks:
  - o CAD \$48.1MM (NGX Cash)
  - o CAD \$52.4MM (Contracting Party Collateral)
  - o USD \$191.5MM (Contracting Party Collateral)
- Non-cash – Letters of Credit:
  - o CAD \$680.2MM (Contracting Party Collateral)
  - o USD \$1,120.8MM (Contracting Party Collateral)

**Principle 4.4** – State whether the CCP is subject to a minimum Cover 1 or Cover 2 requirement in relation to total pre-funded default resources.

For each clearing service, state the number of business days within which the CCP assumes it will close out the default when calculating credit exposures that would potentially need to be covered by the default fund.

For each clearing service, the estimated largest aggregate stress loss (in excess of initial margin) that may be caused by the default of any single participant and its affiliates (including transactions cleared for indirect participants) in extreme but plausible market conditions.

Report the number of business days, if any, on which the estimated largest aggregate loss, exceeded pre-funded default resources (in excess of initial margin) and by how much.

For each clearing service, the actual largest aggregate credit exposure (in excess of initial margin) to any single participant and its affiliates (including transactions cleared for indirect participants).

For each clearing service, the estimated largest aggregate stress loss (in excess of initial margin) that may be caused by the default of any two participants and their affiliates (including transactions cleared for indirect participants) in extreme but plausible market conditions.

Report the number of business days, if any, on which the above amount exceeded actual pre-funded default resources (in excess of initial margin) and by how much.

For each clearing service, the actual largest aggregate credit exposure (in excess of initial margin) to any two participants and their affiliates (including transactions cleared for indirect participants).

*Note under NGX's margin model, credit exposure is measured as the value by which a Contracting Party's total margin requirement exceeded current collateral posted with NGX, for further information please see Principle 6, Key Consideration 1 section of NGX's [Principles for Financial Market Infrastructures Qualitative Disclosure](#).*

As at Q4 2017, NGX is subject to Cover 1 requirements.

NGX's margin model assumes a two day liquidation and close out period. Close out procedures are outlined in Section 5.6 and 8.3 of the Contracting Party Agreement ("CPA") and NGX would follow those procedures. NGX's direct cleared, non-mutualized structure means that non-defaulting Contracting Parties are not exposed to losses by the defaulting Contracting Party, nor does NGX have the ability to directly transfer (port) positions to non-defaulting Contracting Parties without prior consent. Accordingly, NGX tests procedures by conducting regular liquidation simulation events without participation by Contracting Parties.

Cover 1 Estimated Largest Aggregate Stress Loss during Q4 2017:

- Peak Value: CAD \$50,772,522 (October 17, 2017)
- Rolling 12 month Mean Average: CAD \$24,951,891

During Q4 2017, the estimated largest aggregate loss did not exceed the value of pre-funded default resources.

Cover 1 Actual Largest Aggregate Credit Exposure during Q4 2017:

- Peak Value: CAD \$1,201,320 (October 3, 2017)
- Rolling 12 month Mean Average: CAD \$46,380

Cover 2 Estimated Largest Aggregate Credit Exposure during Q4 2017:

- Peak Value: CAD \$80,158,185 (November 1, 2017)
- Rolling 12 month Mean Average: CAD \$44,552,481

During Q4 2017, the two estimated largest aggregate losses did not exceed the value of pre-funded default resources.

	<p>Cover 2 Actual Largest Aggregate Credit Exposure for Q4 2017:</p> <ul style="list-style-type: none"> <li>• Peak Value: CAD \$1,201,320 (October 3, 2017)</li> <li>• Rolling 12 month Mean Average: CAD \$107,104</li> </ul>
--	--

<b>Principle 5: Collateral</b>	
<b>Principle 5.1 – Assets eligible as initial margin and the respective haircuts applied.</b>	
	<p>NGX only accepts USD and CAD cash or Letters of Credit denominated in US or Canadian dollars, in NGX’s standard Letter of Credit format issued by an Approved Financial Institution as defined in the CPA. NGX does not apply haircuts towards these assets. For further details, please refer to NGX’s <a href="#">Principles for Financial Market Infrastructures Qualitative Disclosure</a>.</p>
<b>Principle 5.2 – Assets eligible for pre-funded participant contributions to the default resources and the respective haircuts applied.</b>	
	<p>Pre-funded participant contributions to default resources are limited to the collateral posted by each Contracting Party for their own margin requirements the forms of which are disclosed above in Principle 5.1. Mutualized default contributions are not required under NGX’s non-mutualized, direct clearing model.</p>
<b>Principle 5.3 – Results of testing of haircuts, including the:</b>	
	<ul style="list-style-type: none"> <li>• confidence interval targeted through the calculation of haircuts,</li> <li>• assumed holding/liquidation period for the assets accepted,</li> <li>• look-back period used for testing the haircuts,</li> <li>• number of days during the look-back period on which the fall in value during the assumed holding/liquidation period exceeded the haircut on an asset.</li> </ul>
	<p>Not applicable, NGX does not apply haircuts to Contracting Party collateral.</p>

<b>Principle 6: Margin</b>	
<p><i>For further information regarding NGX’s margin requirements, please reference Principle 6 of NGX’s <a href="#">Principles for Financial Market Infrastructures Qualitative Disclosure</a>.</i></p>	
<b>Principle 6.1</b>	
<p>For each clearing service, total initial margin required, split by house and client.</p> <p>For each clearing service, state whether the initial margin for the positions of indirect participants must be provided for each indirect participants own position or for the net position of a group of indirect participants.</p>	

<p>All current NGX Contracting Parties are direct participants and as such all margin requirements are held entirely for house positions.</p> <p>As at December 31, 2017:</p> <ul style="list-style-type: none"> <li>• Total net initial margin required: CAD \$518,412,592</li> <li>• Total variation margin required: CAD \$294,560,055</li> <li>• Total accounts receivable margin required: CAD \$546,391,249</li> </ul>
<p><b>Principle 6.2 – For each clearing service, total initial margin held, split by house and client.</b></p> <p>For each overall house and client totals of initial margin (or for just the overall total posted, if house and client are not segregated), the amounts of:</p> <ul style="list-style-type: none"> <li>• Cash deposited at a central bank of issue of the currency concerned</li> <li>• Cash deposited at other central banks</li> <li>• Secured cash deposited at commercial banks (including reverse repo)</li> <li>• Unsecured cash deposited at commercial banks</li> <li>• Non-cash             <ul style="list-style-type: none"> <li>o sovereign government bonds                 <ul style="list-style-type: none"> <li>▪ domestic</li> <li>▪ other</li> </ul> </li> <li>o agency bonds</li> <li>o state/municipal bonds</li> <li>o corporate bonds</li> <li>o equities</li> <li>o commodities                 <ul style="list-style-type: none"> <li>▪ gold</li> <li>▪ other (please describe)</li> </ul> </li> <li>o mutual funds / UCITs</li> <li>o other</li> </ul> </li> </ul> <p>Amounts should be reported both pre-haircut and at post-haircut value.</p>
<p>All current NGX Contracting Parties are direct participants and as such all margin requirements are held entirely for house positions.</p> <p>As at December 31, 2017:</p> <ul style="list-style-type: none"> <li>• Total net initial margin held: CAD \$518,412,592</li> <li>• Total variation margin held: CAD \$294,560,055</li> <li>• Total accounts receivable margin held: CAD \$546,391,249</li> <li>• Total cushion and surplus collateral held: CAD \$681,071,061</li> <li>• Total collateral held: CAD \$2,379,372,435</li> </ul>



<p>Total collateral amounts held as December 31, 2017:</p> <ul style="list-style-type: none"> <li>Secured cash deposited at commercial banks: CAD \$292,649,182</li> <li>Letters of Credit issued by Approved Financial Institution: CAD \$2,086,723,253</li> </ul>
<p><b>Principle 6.3 – Initial margin rates on individual contracts, where CCP sets such rates.</b></p>
<p>NGX initial margin rates can be found at <a href="http://www.ngx.com">www.ngx.com</a> under the ‘Downloads &amp; Documents’ section.</p>
<p><b>Principle 6.4 – Type of initial margin model used and key model design parameters for each initial margin model applied to that clearing service – key parameters including, but not limited to:</b></p> <ul style="list-style-type: none"> <li>(i) single-tailed confidence level targeted;</li> <li>(ii) sample/data look-back period for calibrating the model;</li> <li>(iii) adjustments or scalars or weighting, if any, applied to historical data;</li> <li>(iv) close-out/holding periods by product (or, if varying, contract type);</li> <li>(v) for risk aggregation models, the margin rate per contract and details of the offsets between different contracts;</li> <li>(vi) the frequency of parameter reviews.</li> </ul>
<p>The initial margin model and related parameters are outlined in Principle 6, Key Considerations 2 and 3 of NGX’s <a href="#">Principles for Financial Market Infrastructures Qualitative Disclosure</a>. In addition, a copy of NGX’s <a href="#">Margin Methodology Guide</a> is publicly available under the “Downloads &amp; Documents” section of the website.</p>
<p><b>Principle 6.5 – Results of back testing of initial margin. At a minimum, this should include, for each clearing services and each initial margin model applied to that clearing service:</b></p> <ul style="list-style-type: none"> <li>a) Number of times over the past twelve months that margin coverage held against any account fell below the actual marked to market exposure of that member account based on daily back-testing results (specifying if measured intraday/continuously or only once a day. If once a day, specify at what time of day)</li> <li>b) Number of observations</li> <li>c) Achieved coverage level</li> </ul> <p>Where breaches of initial margin coverage have occurred, report on the size of the uncovered exposure.</p>
<p>The Q4 2017 back testing results reported below are within the acceptable performance range for initial margin.</p> <ul style="list-style-type: none"> <li>Number of times margin coverage fell below mark to market exposure (12 month period): 181, measured once a day following closure of the market (exceptions detailed in table below)</li> <li>Number of observations: 40,873</li> <li>Achieved coverage level: 99.6%</li> </ul>

Q1 2017 Initial Margin Breaches			
03/01/2017	\$ 18,858	27/01/2017	\$ 33,880
03/01/2017	\$ 237,930	27/01/2017	\$ 10,143
03/01/2017	\$ 41,152	30/01/2017	\$ 106,257
03/01/2017	\$ 53,730	30/01/2017	\$ 26,038
03/01/2017	\$ 1,166,274	30/01/2017	\$ 262
03/01/2017	\$ 5,846	31/01/2017	\$ 9,148
03/01/2017	\$ 171,299	24/02/2017	\$ 12,872
03/01/2017	\$ 1,972	13/03/2017	\$ 871
27/01/2017	\$ 2,171	28/03/2017	\$ 3,778

Q2 2017 Initial Margin Breaches	
10/04/2017	\$ 4,906
11/04/2017	\$ 329
01/05/2017	\$ 41
29/05/2017	\$ 36,268
29/05/2017	\$ 844

Q3 2017 Initial Margin Breaches							
07/07/2017	\$ 2,025	20/07/2017	\$ 410,300	21/07/2017	\$ 461,862	21/07/2017	\$ 697,415
17/07/2017	\$ 413	20/07/2017	\$ 229,274	21/07/2017	\$ 88,339	21/07/2017	\$ 387,398
20/07/2017	\$ 186,211	20/07/2017	\$ 39,367	21/07/2017	\$ 254,922	21/07/2017	\$ 129,207
20/07/2017	\$ 128,702	20/07/2017	\$ 21,944	21/07/2017	\$ 550,015	27/07/2017	\$ 10,328
20/07/2017	\$ 222,754	21/07/2017	\$ 49,018	21/07/2017	\$ 67,012	27/07/2017	\$ 14,429
20/07/2017	\$ 16,769	21/07/2017	\$ 773,108	21/07/2017	\$ 8,225	27/07/2017	\$ 1,783
20/07/2017	\$ 105,671	21/07/2017	\$ 256,911	21/07/2017	\$ 36,841	28/07/2017	\$ 733
20/07/2017	\$ 163,658	21/07/2017	\$ 213,427	21/07/2017	\$ 240,668	28/07/2017	\$ 785

Q4 2017 Initial Margin Breaches							
03/10/2017	-\$ 1,416,108.84	18/10/2017	-\$ 613,879.09	03/11/2017	-\$ 301.96	18/12/2017	-\$ 17,811.88
04/10/2017	-\$ 58,300.63	19/10/2017	-\$ 25,704.07	03/11/2017	-\$ 37,051.44	20/12/2017	-\$ 111,285.82
04/10/2017	-\$ 162,158.51	19/10/2017	-\$ 315,653.64	03/11/2017	-\$ 29,685.29	20/12/2017	-\$ 29,002.20
04/10/2017	-\$ 182,903.38	19/10/2017	-\$ 236,694.48	06/11/2017	-\$ 78,894.02	25/12/2017	-\$ 336,034.91
04/10/2017	-\$ 29,780.54	24/10/2017	-\$ 273,085.39	06/11/2017	-\$ 2,453.39	26/12/2017	-\$ 818,172.73
04/10/2017	-\$ 103,556.95	24/10/2017	-\$ 26,670.26	09/11/2017	-\$ 350.06	27/12/2017	-\$ 52,956.54
04/10/2017	-\$ 66,553.43	24/10/2017	-\$ 152,020.46	10/11/2017	-\$ 2,320,728.57	27/12/2017	-\$ 146,812.43
04/10/2017	-\$ 194,821.67	24/10/2017	-\$ 180,437.50	10/11/2017	-\$ 64,279.33	27/12/2017	-\$ 74,502.70
04/10/2017	-\$ 118,290.21	25/10/2017	-\$ 94,590.76	10/11/2017	-\$ 35,980.21	27/12/2017	-\$ 18,948.31
04/10/2017	-\$ 24,114.83	25/10/2017	-\$ 88,012.53	13/11/2017	-\$ 2,269,570.08	28/12/2017	-\$ 315,071
06/10/2017	-\$ 71,848.71	25/10/2017	-\$ 582,413.03	13/11/2017	-\$ 456,120.29	28/12/2017	-\$ 1,291,586
06/10/2017	-\$ 1,215,535.38	31/10/2017	-\$ 85,333.88	30/11/2017	-\$ 20,565.96	28/12/2017	-\$ 637,835
06/10/2017	-\$ 160,282.95	31/10/2017	-\$ 18,658.04	30/11/2017	-\$ 852,104.85	28/12/2017	-\$ 1,100,990
11/10/2017	-\$ 1,656.03	31/10/2017	-\$ 6,389.81	30/11/2017	-\$ 164,272.55	28/12/2017	-\$ 111,728
12/10/2017	-\$ 188,449.23	31/10/2017	-\$ 132,097.54	30/11/2017	-\$ 15,294.23	28/12/2017	-\$ 72,582
12/10/2017	-\$ 1,658,563.88	01/11/2017	-\$ 28,861.10	01/12/2017	-\$ 178,129.80	28/12/2017	-\$ 906,123
12/10/2017	-\$ 36,762.93	01/11/2017	-\$ 57,657.96	01/12/2017	-\$ 1,686,451.88	28/12/2017	-\$ 1,271
12/10/2017	-\$ 39,413.15	01/11/2017	-\$ 55,724.49	04/12/2017	-\$ 98,840.01	29/12/2017	-\$ 595,026
13/10/2017	-\$ 222,367.72	01/11/2017	-\$ 107,877.54	04/12/2017	-\$ 587,548.99	29/12/2017	-\$ 1,965
13/10/2017	-\$ 244,615.82	02/11/2017	-\$ 38,594.23	12/12/2017	-\$ 113,104.55	29/12/2017	-\$ 38,503
18/10/2017	-\$ 534,493.28	03/11/2017	-\$ 44,839.43	12/12/2017	-\$ 41,401.97	29/12/2017	-\$ 142,272

**Principle 6.6** – Average total variation margin paid to the CCP by the participants each business day over the period.

Average Daily Settlement Invoice during Q4 2017: CAD \$211,818.02

Note this value reflects the average value of NGX’s daily settled Canadian Financial Electricity Futures Contracts which are settled on a t+2 daily basis. For all other products, variation margin is accrued in monthly settlement values. Further information related to NGX monthly settlements are found in NGX’s [Principles for Financial Market Infrastructures Qualitative Disclosure](#).

**Principle 6.7** – Maximum total variation paid to the CCP by the participants each business day over the period.

Maximum Daily Settlement Invoice during Q4 2017: CAD \$16,117,591 (December 8, 2017)

**Principle 6.8** – Maximum aggregate initial margin call on any given business day over the period.

Maximum aggregate margin call during Q4 2017: USD\$20MM (December 11, 2017)

Margin call value is comprised of \$16.7MM for initial margin, \$18.9MM for variation margin and \$102.0MM for AP/AR receipts.

<b>Principle 7: Liquidity Risk</b>	
<p><b>Principle 7.1</b> – State whether the clearing service maintains sufficient liquid resources to 'Cover 1' or 'Cover 2'.</p> <p>Size and composition of qualifying liquid resources for each clearing service – for each relevant currency – split by:</p> <ul style="list-style-type: none"> <li>a) Cash deposited at a central bank of issue of the currency concerned;</li> <li>b) Cash deposited at other central banks;</li> <li>c) Secured cash deposited at commercial banks (including reverse repo);</li> <li>d) Unsecured cash deposited at commercial banks;</li> <li>e) Secured committed lines of credit including committed foreign exchange swaps and committed repos;</li> <li>f) unsecured committed lines of credit;</li> <li>g) highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements even in extreme but plausible market conditions;</li> <li>h) other.</li> </ul> <p>State whether the CCP has routine access to central bank liquidity or facilities.</p> <p>If, in using qualifying liquid resources, the CCP is required or allowed to give priority to meeting certain payment obligations, please provide or reference:</p> <ul style="list-style-type: none"> <li>• the schedule of payments or priority for allocating payments, if such exists;</li> <li>• any applicable rule, policy, procedure, and governance arrangement around such decision making.</li> </ul>	
	<p>As at the end of Q4 2017, NGX maintained sufficient liquid resources to meet the requirements for Cover 1.</p> <p>Size and composition of qualifying liquid resources as at December 31, 2017:</p> <ul style="list-style-type: none"> <li>• Unsecured cash deposited at commercial banks: CAD \$48.1MM</li> </ul> <p>NGX does not use central bank liquidity or facilities at this time. While NGX is not required to give priority to payment obligations, it retains the right to give priority to meeting the most immediate settlement obligations.</p>
<p><b>Principle 7.2</b> – Size and composition of qualifying liquid resources for each clearing service above those qualifying liquid resources above.</p>	
	<p>NGX has one clearing service, as per IOSCO definition of a clearing service. All qualifying liquid resources outlined in Principle 7.1 above are for NGX CCP operations.</p>

<p><b>Principle 7.3</b> – The estimated largest same-day and, where relevant, intraday and multiday payment obligation in total that would be caused by the default of any single participant and its affiliates (including transactions cleared for indirect participants) in extreme but plausible market conditions.</p> <p>The number of business days, if any, on which the above amount exceeded its qualifying liquid resources (identified as in 7.1, and available at the point the breach occurred), and by how much.</p> <p>The actual largest intraday and multiday payment obligation of a single participant and its affiliates (including transactions cleared for indirect participants) over the past twelve months.</p> <p>The estimated largest same-day and, where relevant, intraday and multiday payment obligation in each relevant currency that would be caused by the default of any single participant and its affiliates (including transactions cleared for indirect participants) in extreme but plausible market conditions.</p> <p>The number of business days, if any, on which the above amounts exceeded its qualifying liquid resources in each relevant currency (as identified in 7.1 and available at the point the breach occurred), and by how much.</p>
<p>The value reported reflects NGX’s stress testing results of its daily settled Canadian Financial Electricity Futures Contracts in extreme, but plausible conditions. For further information, please reference Principle 7, Key Consideration 4 section of NGX’s <a href="#">Principles for Financial Market Infrastructures Qualitative Disclosure</a></p> <p>Largest estimated payment obligation during Q4 2017: CAD \$29.07MM (December 6, 2017)</p> <p>Number of Business Days on which the above amount exceeded qualifying liquid resources: 0, the estimated largest payment obligation did not exceed NGX’s qualifying liquid resources.</p> <p>Largest actual daily settlement payment obligation (rolling 12 month period): CAD \$16,117,591 (December 8, 2017)</p> <p>NGX conducts stress testing on all of its daily settlement obligations which are settled exclusively in Canadian dollars.</p> <p>No single daily settlement obligation for any participant of affiliates has exceeded NGX’s qualifying liquid resources.</p>

<b>Principle 12: Exchange-of-Value Settlement Systems</b>	
<b>Principle 12.1 and Principle 12.2</b>	
	Not applicable. NGX does not use a DvP, DvD or PvP settlement system nor does NGX have linked obligations for settlement

<b>Principle 13: Participant-Default Rules and Procedures</b>	
<p><b>Principle 13.1</b> – CCPs are encouraged, subject to legal constraints on timing and content, to disclose as soon as practicable quantitative information related to defaults, such as:</p> <ul style="list-style-type: none"> <li>• Amount of loss versus amount of initial margin</li> <li>• Amount of other financial resources used to cover losses</li> <li>• Proportion of client positions closed-out/porting</li> </ul> <p>Appropriate references to other published material related to the defaults may also be helpful.</p>	
	<p>NGX has not sustained any Contracting Party default resulting in any loss or necessitating the use of NGX’s financial resources since inception.</p> <ul style="list-style-type: none"> <li>• Amount of loss versus amount of Initial Margin: \$0</li> <li>• Amount of other financial resources used to cover losses: \$0</li> <li>• Proportion of client positions closed out/porting: 0%</li> </ul>

<b>Principle 14: Segregation and Portability</b>	
<p><b>Principle 14.1</b> – Split, by clearing service, of total client positions held in:</p> <ol style="list-style-type: none"> <li>individually segregated accounts;</li> <li>omnibus client-only accounts, other than LSOC accounts (see below);</li> <li>legally segregated but operationally comingled (LSOC) accounts;</li> <li>comingled house and client accounts;</li> </ol> <p>as a share of notional values cleared or of the settlement value of securities transactions.</p>	
	<p>All collateral positions held with NGX are in individually segregated accounts as follows:</p> <ul style="list-style-type: none"> <li>• USD Cash Collateral Accounts: 101</li> <li>• CAD Cash Collateral Accounts: 47</li> <li>• USD Letters of Credit: 76</li> <li>• CAD Letters of Credit: 80</li> </ul>

<b>Principle 15: General Business Risk</b>	
<p><b>Principle 15.1</b> – (a) Value of liquid net assets funded by equity; and (b) Six months of current operating expenses</p>	
	<p>As at December 31, 2017:</p> <ol style="list-style-type: none"> <li>Value of liquid net assets funded by equity: CAD \$48.1MM</li> <li>Six months of current operating expenses: CAD \$9.1MM</li> </ol>
<p><b>Principle 15.2</b> – Annual financial disclosures: including, but not limited to,</p> <ul style="list-style-type: none"> <li>• total revenue,</li> </ul>	

<ul style="list-style-type: none"> <li>• total expenditure,</li> <li>• profits,</li> <li>• total assets,</li> <li>• total liabilities.</li> </ul> <p>Explain if collateral posted by clearing participants is held on or off the CCP's balance sheet.</p>
<p>NGX consolidated financial statements as at December 31, 2017:</p> <ul style="list-style-type: none"> <li>• Total Revenue: CAD \$48.8MM</li> <li>• Total Expenditure: CAD \$32.0MM</li> <li>• Profits: CAD \$13.6MM</li> <li>• Total Assets: CAD \$989.5MM</li> <li>• Total Liabilities: CAD \$948.4MM</li> <li>• Total Equity: CAD \$41.1MM</li> </ul> <p>Collateral held by NGX is disclosed in the notes to the financial statements and not captured on the balance sheet.</p>
<p><b>Principle 15.3 – Income Breakdowns:</b></p> <ul style="list-style-type: none"> <li>• percentage of total income that comes from fees related to provision of clearing services;</li> <li>• percentage of total income that comes from the reinvestment (or rehypothecation) of assets provided by clearing participants.</li> </ul>
<p>As at December 31, 2017:</p> <ul style="list-style-type: none"> <li>• Percentage of total income derived from fees related to provision of clearing services: 81%</li> <li>• Percentage of total income that comes from reinvestment of assets provided by clearing participants: 1%, derived from NGX's portion of interest earned on cash collateral deposits only</li> </ul>

<p><b>Principle 16: Custody and Investment Risks</b></p>
<p><b>Principle 16.1 – Total cash (but not securities) received from participants, regardless of the form in which it is held, deposited or invested, split by whether it was received as initial margin or default fund contribution.</b></p>
<p>As of end of Q4 2017, NGX held CAD \$292.6MM equivalent in cash collateral from Contracting Parties for total margin requirements including initial margin, accounts receivable, and variation margin. Contracting Parties do not contribute to NGX's self-funded default fund.</p>
<p><b>Principle 16.2 – How the total cash received from participants (ie the combined total of initial margin and default fund contributions in 16.1) is held/deposited/invested, including:</b></p>

- percentage of this total participant cash held as cash deposits (including through reverse repo); further split into:
  - percentage held:
    - as cash deposits at central banks of issue of the currency deposited;
    - as cash deposits at other central banks;
    - as cash deposits at commercial banks; of which:
      - percentage secured (including through reverse repo);
      - percentage unsecured;
    - in money market funds;
    - in other forms (please specify).
  - percentage split by currency of these cash deposits (including reverse repo) and money market funds - local currency, USD, EUR, other.
- Also:
  - weighted average maturity of these cash deposits (including reverse repo) and money market funds
- percentage of this total participant cash invested in securities; further split into:
  - percentage invested in:
    - sovereign government bonds; of which:
      - domestic;
      - other;
    - agency bonds;
    - state/municipal bonds;
    - other instruments (please describe).
  - percentage split by currency of these securities - local currency, USD, EUR, other.
- Also:
  - weighted average maturity of these securities

Provide an estimate of the risk on the investment portfolio (excluding central bank and commercial bank deposits) (99% one-day VaR, or equivalent).

State if the CCP investment policy sets a limit on the proportion of the investment portfolio that may be allocated to a single counterparty, and the size of that limit.

State the number of times over the previous quarter in which this limit has been exceeded.

All Contracting Party cash collateral disclosed in Principle 16.1 above is held in secured cash deposits held at a Canadian Schedule 1 commercial bank. Cash collateral is held in the same denomination it is received.

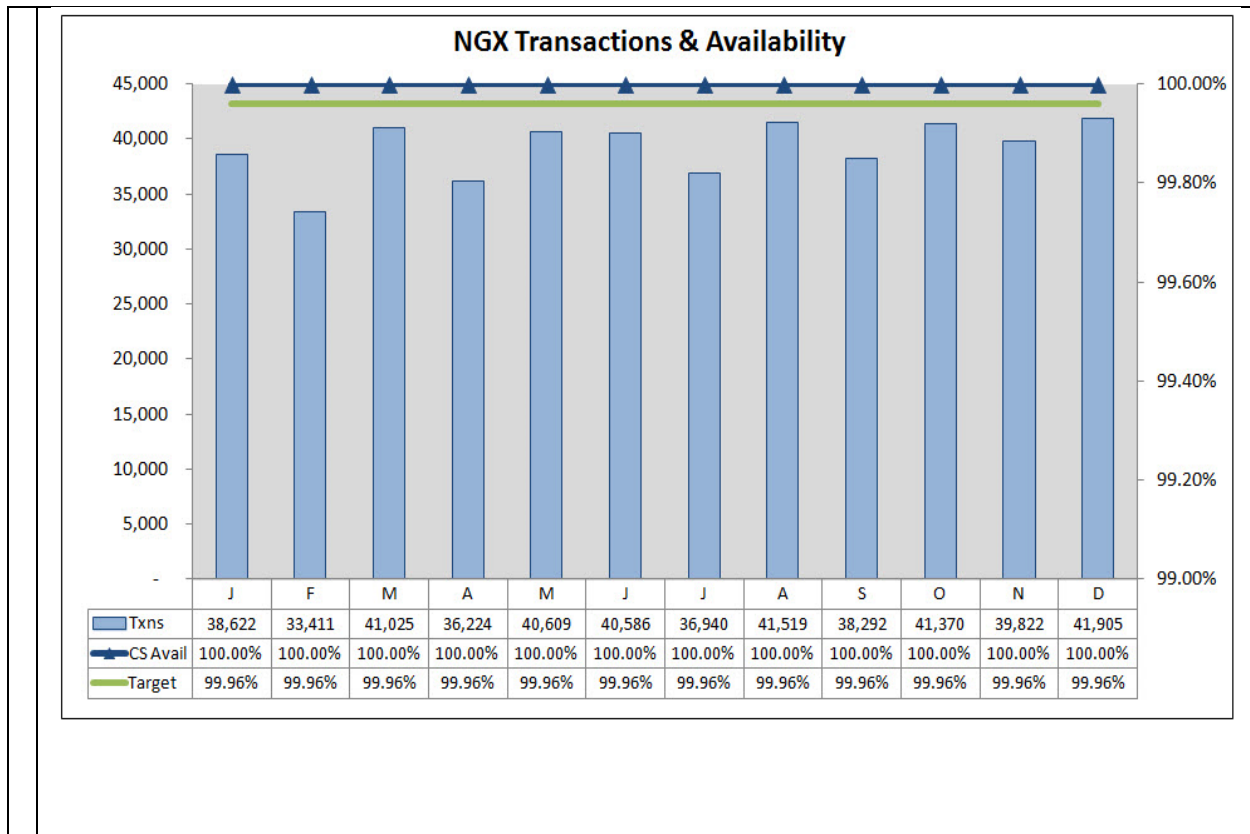
As at December 31, 2017 the percentage of cash collateral split by currency was 82.1% USD and 17.9% CAD.

NGX does not re-invest Contracting Party collateral.



<p><b>Principle 16.3</b> – Rehypothecation of participant assets (i.e., non-cash) by the CCP where allowed, split by initial margin and default fund:</p> <ul style="list-style-type: none"> <li>• total value of participant non-cash rehypothecated;</li> <li>• maturities (overnight/one day; over one day and up to one week; over one week and up to one month; over one month and up to one year; over one year and up to two years; over two years).</li> </ul>	
	<p>Not applicable. NGX does not re-invest Contracting Party collateral.</p>

<p><b>Principle 17: Operational Risk</b></p>	
<p><b>Principle 17.1</b> – Operational availability target for the core system(s) involved in clearing (whether or not outsourced) over specified period for the system.</p>	
	<p>NGX has an operational system uptime objective of 99.995% on an annual basis. For further details please refer to Principle 17, Key Considerations 3 of NGX’s <a href="#">Principles for Financial Market Infrastructures Qualitative Disclosure</a>.</p>
<p><b>Principle 17.2</b> – Actual availability of the core system(s) over the previous twelve month period.</p>	
	<p>Actual availability of the core system as of December 31, 2017 (rolling 12 month period): 100% (monthly availability illustrated below)</p>



**Principle 17.3 – Total number and duration of failures affecting the core systems involved in clearing over the previous twelve month period.**

NGX did not experience any system failures over the previous 12 months as of December 31, 2017.

**Principle 17.4 – Recovery Time Objectives**

NGX’s Recovery Time Objective is within 2 hours.

**Principle 18: Access and Participation Requirements**

**Principle 18.1 – Number of clearing members, by clearing service, split by:**

- category of membership;
- type of participant; and
- domestic or foreign participants.

As at December 31, 2017, NGX had 281 Contracting Parties as defined under the CPA, all of which were direct participants.

- Category of membership:
  - Direct Participant: 281

<ul style="list-style-type: none"> <li>○ Special Participant: 0</li> <li>● Type of Participant:             <ul style="list-style-type: none"> <li>○ Financial Institution: 28</li> <li>○ Other: 251</li> </ul> </li> <li>● Domestic or Foreign participation:             <ul style="list-style-type: none"> <li>○ Domestic Participants: 124</li> <li>○ Foreign Participants: 157</li> </ul> </li> </ul>
<p><b>Principle 18.2</b> – For each clearing service with 25 or more members, the percentage of open positions held by the largest five and ten clearing members, including both house and client, in aggregate.</p>
<p>All NGX Contracting Parties are direct participants therefore, all accounts are house accounts. During Q4 2017:</p> <ul style="list-style-type: none"> <li>● Average Top 5 Contracting Parties: 31.5%</li> <li>● Average Top 10 Contracting Parties: 49.3%</li> <li>● Peak Top 5 Contracting Parties: 33.6%</li> <li>● Peak Top 10 Contracting Parties: 51.6%</li> </ul>
<p><b>Principle 18.3</b> – For each clearing service with 25 or more members percentage of initial margin held by the largest five and ten clearing members, including both house and client, in aggregate.</p>
<p>All NGX Contracting Parties are direct participants therefore, all accounts are house accounts. During Q4 2017:</p> <ul style="list-style-type: none"> <li>● Average Top 5 Contracting Parties: 23.7%</li> <li>● Average Top 10 Contracting Parties: 37.6%</li> <li>● Peak Top 5 Contracting Parties: 24.3%</li> <li>● Peak Top 10 Contracting Parties: 38.3%</li> </ul>
<p><b>Principle 18.4</b> – For each segregated default fund with 25 or more members percentage of participant contributions to the default fund contributed by the largest five and ten members in aggregate.</p>
<p>NGX is a CCP with a self-funded default fund and does not require default fund contributions from its members.</p> <ul style="list-style-type: none"> <li>● Top 5 Contracting Parties: 0</li> <li>● Top 10 Contracting Parties: 0</li> </ul>

<p><b>Principle 19: Tiered Participation Arrangements</b></p>
<p><b>Principle 19.1:</b> Measures of concentration of clearing clients:</p> <ul style="list-style-type: none"> <li>● Number of clients</li> <li>● Number of direct members that clear for clients</li> </ul>

<ul style="list-style-type: none"> <li>Per cent of client transactions by clearing service (by total gross notional for derivatives or total cleared value of securities transactions or similar) attributable to the top five clearing members and top ten clearing members.</li> </ul>
Not applicable. All NGX Contracting Parties are direct participants, and as such NGX has not identified any measures of concentration with clearing clients.

<b>Principle 20: FMI Links</b>	
<b>Principle 20.1 through Principle 20.7</b>	
Not applicable. NGX does not have links to another FMI.	

<b>Principle 23: Disclosure of Rules, Key Procedures, and Market Data</b>						
<b>Principle 23.1 – Average daily volumes and notional value of new trades cleared, by instrument/ asset class, by currency and split by OTC or exchange traded.</b>						
<b>As at December 31, 2017</b>		<b>CAD Gas</b>	<b>US Gas</b>	<b>CAD Power</b>	<b>US Power</b>	<b>Crude</b>
<b>Exchange Traded</b>	Average Daily Volume (TJ)	33,281	4,452	187	128	0
	Average Daily Notional Value (CAD \$MM)	\$64.0	\$8.1	\$0.3	\$0.2	\$0.0
<b>OTC</b>	Average Daily Volume (TJ)	11,298	1,350	285	312	0
	Average Daily Notional Value (CAD \$MM)	\$21.8	\$	\$ 0.5	\$0.6	\$0.0
<b>Principle 23.2 – Gross notional outstanding/total settlement value of novated but not-yet settled securities transactions per instrument/asset class and currency and split by OTC or exchange-traded.</b>						
Not applicable. NGX products are limited to physically and financially settled energy commodities transactions.						
<b>Principle 23.3 – Average daily volumes and notional contract values submitted by each execution facility or matching/confirmation venue.</b>						
<b>As at December 31, 2017</b>		<b>ICE</b>	<b>NGX</b>			
<b>Average Daily Volume (TJ)</b>		40,060	10,299			
<b>Average Daily Notional Value (CAD \$MM)</b>		\$77.3	\$29.5			