

## Evening presentation on 12<sup>th</sup> of April 2017

### Non-Traditional Solutions to Tap Connect Transmission Generators

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The presenter introduced the concept of non-utility “green” generators and the challenges integrating these installations into the main utility transmission infrastructure.

Non-utility “green” (NUG) generator systems can take on a number of forms including hydro-electric, wind or solar. Generally their power output is intermittent and they have a lower power output capacity than traditional sources (i.e. < 15MegaWatts).

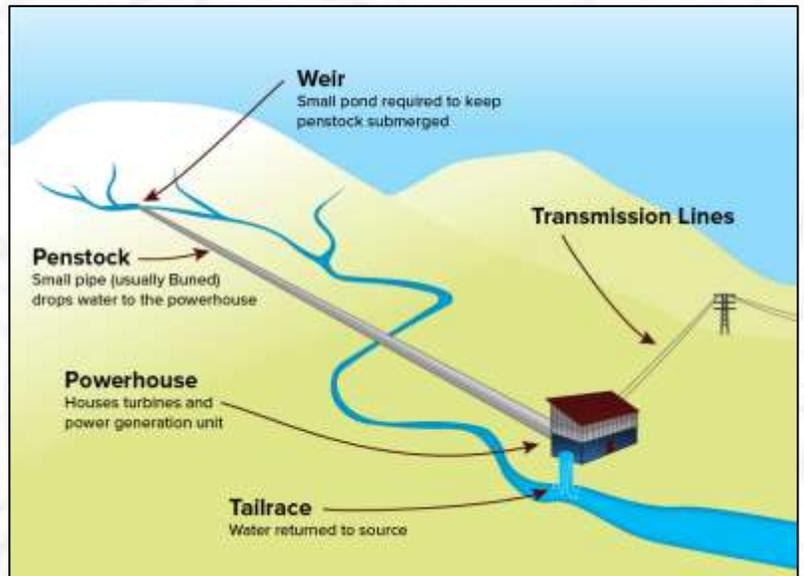
Until relatively recently the main utility companies were not interested in the integration of NUG system technology. However, this situation is not the same today.

Historically, utilities-owned generation and transmission systems are large and their connection to the existing transmission system used to be a part of an integrated planning process.

Transmission tap-connected generators were typically not employed and the line protection systems were traditionally two-terminal schemes. Privately owned generators, especially those based on “green” technologies, are usually small- to medium-size generators and produce energy intermittently only. The high cost of interconnection using a conventional method, building either a new transmission circuit or a switching station, may sometimes destroy the business case of the generator which is of much smaller size than the traditional utility-owned generating stations.

Interconnection though does present a variety of technical problems. Above all though, safety, reliability and power quality must not be compromised. Interconnection must be based on consistent and uniform criteria and sound engineering principles.

BC Hydro developed creative non-traditional protection schemes which has facilitated tap connections of more than 22 generators over the last two decades. Their interconnection costs were a fraction (typically one over twentieth or less) of the amount required by the



conventional methods. The generators are not only supplying the “green” energy into the grid but also cultivating developmental opportunities in remote communities.