**Project Manager Qualifications and Organization Description**

Michele Guala, Associate professor, Department of Civil Environmental and Geo- Engineering CEGE,

Associate Director of St. Anthony Falls Laboratory (SAFL), University of Minnesota, Minneapolis, 55414, MN

**Education**

**Ph.D.** Hydraulic Engineering, 2003, University of Padova, Italy

*Laurea (BS+MS)* Civil and Environmental Engineering, 1998, University of Genova, Italy

**Professional experience**

UMN , SAFL & Department of Civil, Environmental, and Geo‐ Engineering, associate professor 2017--

UMN , SAFL & Department of Civil, Environmental, and Geo‐ Engineering, assistant professor 2011-2017

Caltech Postdoctoral GALCIT, Caltech, Pasadena , 2008-2010, SLF, Davos Research scientist 2007,

ETH Zurich, CH Postdoctoral fellow at the Institute of Hydromechanics 2003-2006

**Awards/Recognitions**

Recipient of the **NSF CAREER award** “Geophysical Flow Control” (2014-2019)

Recipient of the **IREE Early Career Award** (UMN) “*Evaluating wind farm performance under realistic thermal and complex terrain conditions: the first path towards optimization*

**Publications *(Relevant to this LCCMR proposal)***

1) B Dou, M Guala, L Lei, P Zeng “Wake model for horizontal-axis wind and hydrokinetic turbines in yawed conditions” **Applied Energy** 242, 1383-1395, (**2019)**

2) Musa M, Hill C., Sotiropoulos F., Guala M. “Performance and resilience of hydrokinetic turbine arrays under large migrating fluvial bedforms” **Nature Energy** 3 (10), **(2018).**

3) Musa M. Heisel M. and Guala M. “Predictive model for local scour downstream of hydrokinetic turbines in erodible channels ”**Physical Review Fluids** 3 (2), 02460, **(2018).**

4) Hill C., Musa M. and Guala M. “Interaction between axial flow hydrokinetic turbines and uni-directional

flow bedforms. " **Renewable Energy** 86, 409-421 (**2016**)

5) Hill C, Kozarek J. Sotiropoulos F., Guala M. “Hydrodynamics and sediment transport in a meandering channel with a model axial flow hydrokinetic turbine” **Water Resources Research** (**2016**)

6) Hill C. , M Musa , LP Chamorro, C Ellis, M Guala , “Local Scour around a Model Hydrokinetic Turbine in an Erodible Channel**” Journal of Hydraulic Engineering**, 140(8) 04014036, **(2014**).

**ORGANIZATION DESCRIPTION: University of Minnesota**

The proposed research will be performed at the St. Anthony Falls Laboratory (SAFL), University of Minnesota. SAFL faculty, staff and researchers have an excellent scientific reputation and experience in conducting and analyzing laboratory and field measurements for energy converter installations in wind tunnel and river flows, as well as deploying utility-scale device (EOLOS 2.5MW wind turbine). The SAFL Outer stream laboratory and Main channel are unique facilities that are perfectly suitable for these tests.

The team recently participated to a Pilot Workshop on technology innovation sponsored by the Office of Technology and Commercialization of UMN (April 2019). The major value proposal emerging is in the bank protection capability enabling this technology to increase the readiness level and be price competitive before marketing.

**TEAM DESCRIPTION**

**Michele Guala** will supervise the turbine design, the performance quantification, and the sheltering effects on side bank erosion. He will be coordinating all the research activities, including documentation and reporting.

**Jeff Marr** is the SAFL director of applied research. He has expertise in laboratory experiments and testing, river mechanics, sediment transport and field scale models. He will supervise prototype fabrication, field testing and deployment.

**Lian Shen** (professor in Mechanical Eng. UMN, and SAFL associate director) is an expert in computation fluid mechanics and fluid structure interaction. He will contribute to design optimization and to scaling up to the prototype.