

PEGASUS - PHYCOMORPH EUROPEAN GUIDELINES FOR SUSTAINABLE AQUACULTURE OF SEAWEEDS

Michèle Barbier*¹, Bénédicte Charrier², Rita Araujo³, Susan Holdt⁴, Bertrand Jacquemin⁵, Céline Rebours⁶

With contributions from Helena Abreu⁷, Annette Bruhn⁸, Olivier de Clerck⁹, Jon Funderund¹⁰, Alexander Golberg¹¹, Aleksander Handå¹², Leila Ktari¹³, Frank Neumann¹⁰, César Peteiro¹⁴, Pierre Ronan⁵, Pierrick Stévant⁶, Eric Tamigneaux¹⁵, Klaas Timmermans¹⁶, Thomas Wichard¹⁷.

¹ *Institute for Science & Ethics, 31 avenue Maréchal Foch, 06000 France (mbarbier@sciencethics.org);*

² *Station Biologique de Roscoff, CNRS, France;* ³ *European Commission – DG JRC - Ispra;* ⁴ *Technical University of Denmark;* ⁵ *Centre d'Etude et de Valorisation des Algues, France;* ⁶ *Møreforskning Ålesund AS, Norway;* ⁷ *ALGAplus, Portugal;* ⁸ *Institute for Bioscience, Aarhus University, Denmark;* ⁹ *University of Gent, Belgium;* ¹⁰ *Seaweed Energy Solution, Norway;* ¹¹ *Tel Aviv University, Israel;* ¹² *SINTEF, Norway;* ¹³ *INSTM – National Institute of Marine Sciences et Technologies, Tunisia;* ¹⁴ *IEO - Instituto Español de Oceanografía, Spain;* ¹⁵ *CEGEP, École des pêches et de l'aquaculture du Québec, Canada;* ¹⁶ *NIOZ, Royal Netherlands Institute for Sea Research, Netherlands;* ¹⁷ *University Jena, Germany*

Seaweed resources play an increasingly important role in the European Blue Growth and Bioeconomy strategies. European production, mainly based on the harvesting of wild stocks is anticipated to boost with the increasing market interest in seaweed resources and the need to assure the environmental sustainability of future aquaculture. No homogeneous regulations exist across Europe, but attention is rising at national levels to accompany industries in the development of seaweed aquaculture in a sustainable way. In the framework of the COST Action FA1406 PHYCOMORPH, a working group developed guidelines for the future development of this sector, taking into account scientific, technical, environmental, legal and socio-economic dimensions. Challenges, bottlenecks and risks are identified and presented with a special focus on production issues regarding proliferation, breeding, choice of best cultivar, etc and on the risk of using non-indigenous and invasive species. The legislation and barriers for long-term sustainable exploitation are also questioned as are the Nutrition & Health Regulation required to ensure food security. The PEGASUS guidelines present scientific and ethical recommendations to overcome these issues and to provide science-based advice to both Policy makers and industries for the sustainable development of seaweed aquaculture in Europe and beyond.